User Documentation

MYECL™ Imager Manual

Thermo
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Table of Contents

Chapter 1: Overview 1

Thank You and Welcome Letter 1

Contacting Thermo Fisher Scientific 2

Imager Overview 2

Included Accessories 2

Functionality 3

MYECL Imager Acquisition Software 3

MYImageAnalysis Software 4

Chapter 2: Imager 5

Installation Guidelines 5

Space Requirements 5

Electrical Requirements 5

Environmental Requirements 6

Computer Requirements 6

Imager Images with Feature Locations 7

Start Up 10

Shut Down 11

USB Features 12

Imager Settings 13

Tools 13

Date and Time 14

Printer 15

Filters 16

Administrator Settings 18

Set Image Gallery Location 19

Allow Remote Access 19

Other Operating System (OS) Settings 21

Reset Default Focus Position 21

Update Software 21

Change Username and Password 21

Create Dark and Bias Images 22
Return 24

Chapter 3: Image Acquisition 25
Imager Settings 25
Live Camera 25
Live Camera in Chemi Mode 25
Live Camera in UV Mode 26
Live Camera in Vis Mode 26
Camera Settings Available in Chemi, UV and Vis Modes 27
Settings Only Available in UV and Vis Modes 29
Chemiluminescence (Chemi) Mode 30
Camera Settings 30
Interactive Chemi 30
Capture Settings 33
Single Image Acquisition 33
Pre-set Exposure Time 34
Custom Exposure Time 35
Multiple Image Acquisition 36
Pre-set Multiple Exposure Settings 37
User-defined Multiple Exposure Settings 38
Image Tools 40
Display Saturation 40
Invert Image 41
Auto Contrast 41
Adjust Image 42
Intensity Display 43
Zoom 43
File Menu 43
Image Info 44
Export 45
Print 45
Delete 45
Ultraviolet (UV) Mode 46
Camera Settings 46

Capture Settings 46
Image Acquisition 46
Pre-set Exposure Time 47
Custom Exposure Time 48
Stop Image Acquisition 49
Image Tools 49
Display Saturation 49
Invert Image 50
Auto Contrast 50
Adjust Image 50
Intensity Display 51
Zoom 51
File Menu 51
Image Info 51
Export 51
Print 51
Delete 51
Visible (Vis) Mode 52
Camera Settings 52
Image Acquisition–Transmitted Light 52
Image Acquisition–Reflected Light 53
Pre-set Exposure Time 53
Custom Exposure Time 54
Image Tools 54
Display Saturation 55
Invert Image 55
Auto Contrast 56
Adjust Image 56
Intensity Display 56
Zoom 56
File Menu 56
Image Info 56
Export 56
Print 57
Delete 57
Image Gallery 57
Image Viewing 57
Thumbnail 57

File List 58
Search 58
Search Results 59
File Manager 59
Copy 59
Delete 59
Export 60
Edit Info 60
Unselect 60
Exit File Manager 60

Chapter 4: Maintenance 61
Cleaning the Imager and Sample Screens 61
LCD Touchscreen 61
Use of the Stylus 61
UV Transilluminator 62
Band Excision 62
Cleaning the Transilluminator 63
Replacement of Transilluminator Bulbs 63
Emission Filters 64
Changing Filters 64

Appendix A: Technical Specifications 66

Appendix B: Accessories 67

Appendix C: Related Thermo Scientific Products 68

Glossary 69

Chapter 1 Overview

Thank You and Welcome

Dear Researcher:

We thank you for your investment in our Thermo Scientific™ MYECL™ Imager. We have worked to design a highly functional, yet intuitive, imager that will provide you with valuable images and data of high-resolution and quality.

This manual has been written as a concise guide for the start-up, use and customization of your MYECL Imager unit and acquisition software. Detailed sections covering the imager, image acquisition, file management, maintenance and troubleshooting provide comprehensive information. We encourage you to read the entire manual for a full understanding of the imager, but a Quick Start guide is provided if you want to begin using your new imager immediately.

Thermo Scientific products are always at the forefront of scientific instrument design, and we strive to design and produce instruments that can help you achieve your research goals. Your feedback is a valuable tool that we use for future product development, so please contact us if you have any questions, comments or suggestions.

IMPORTANT Review and implement guidelines for proper set-up before installation. Locate the imager away from water, solvents, corrosive materials, strong magnetic fields and vibration sources.

IMPORTANT The imager weighs 65lbs (29.5kg). Please use two people to lift it by grasping the bottom and the handle at the rear of the imager. Using two people, place the imager onto the benchtop given proper space, electrical and environmental requirements. Remove the outer packaging materials.

IMPORTANT Imager use outside of the workflows described in this manual may put the operator at risk of dangerous exposure to electrical shock or radiated emissions. Do not use this instrument for any purposes or in any configurations not described in this manual.

Contacting Us

For technical or service assistance on the MYECL Imager:

- U.S. Customers: 1-800-874-3723
- International Customers: 1-815-968-0747
- European Customers: +49-228-8502820
- Asia/Pacific Customers: +81-3-5826-1659

Technical Support email for U.S. and international customers:
pierce.ts@thermofisher.com

Technical Support email for European customers:
perbio.eurotech@thermofisher.com

Technical Support email for Asia/Pacific customers:
Info.bid.jp@thermofisher.com

For more information about the Thermo Scientific Protein Biology product line, please visit our website: www.thermoscientific.com/pierce

Imager Overview

The MYECL Imager is designed to be a useful tool for the researcher needing intuitive equipment and software with fast imaging capabilities.

Included Accessories

Your imager purchase includes the following accessories (each quantity 1):

Thermo Scientific MYImageAnalysis Software
MYECL Imager User Manual CD
Chemiluminescence exposure screen
White light conversion screen
UV exposure screen
Imaging reference target
Quick start guide
USB memory device
Stylus
Stylus holder
Power cord with C13 connector

Optional items, including additional filters and UV bulbs (365nm), may be added to the above list depending on the items ordered with the imager.

Note Upon receiving your imager, please verify you have received all of the items listed above. Please contact Thermo Scientific Technical Support for assistance.

Functionality

The MYECL Imager provides:

- UV and white light illumination source for imaging of samples
- Acquisition of chemiluminescent Western blot and electrophoresis gel images with varying resolution (1×1, 2×2, 3×3, 4×4 and 8×8 binning)
- Low-noise, high-dynamic range CCD camera detection
- Hardware and software optimized for image acquisition
- One-touch image acquisition
- Multiple image acquisition with pre-set and user-defined settings

MYECL Imager Acquisition Software

Each imager arrives loaded with the MYECL Imager Acquisition Software. This manual gives detailed information on using all software functions and modes.

The acquisition software allows you to acquire images using three different modes:

Chemiluminescence (Chemi) mode for image acquisition of self-emitting, chemiluminescent light

Ultraviolet (UV) mode for image acquisition of UV-transmitted light

Visible (Vis) mode for image acquisition of reflected and/or transmitted light

MYImageAnalysis™ Software

The MYImageAnalysis Software is supplied with the MYECL Imager as a vital tool for extracting information from your captured images. The analysis software features:

- Identify lanes and bands automatically
- View and compare up to six images simultaneously
- Open multiple image formats (e.g., .tif, .jpeg, .png, etc.)
- Export images and data reports directly to Microsoft™ Excel™, Word™ and PowerPoint™ software for further analysis and presentations
- Analyze molecular weight – determine the R_f and molecular weight of protein or nucleic acid bands using installed or custom added molecular weight markers
- Edit digital images – image editing tools include contrast adjustment, image rotation, cropping, de-speckling, false color application and text annotation
- Calculate sample purity automatically based on band and lane intensity
- Perform lane profile densitometry
- Quantitate bands or regions relatively or absolutely

Acquired images are saved and exported as .tif files, which can be directly opened in the analysis software.

Chapter 2 Imager

Installation Guidelines

IMPORTANT Review and implement guidelines for proper set-up before installation. Locate the imager away from water, solvents, corrosive materials, strong magnetic fields and vibration sources.

IMPORTANT The imager weighs 65lbs (29.5kg). Use two people to lift it by grasping the bottom and the handle at the rear of the imager. Using two people, place the imager onto the benchtop given proper space, electrical and environmental requirements. Remove the outer and inner packaging materials.

Space Requirements

The imager requires a stable laboratory bench or table capable of supporting 65lbs (29.5kg). Provide a minimum clearance of 3 inches (7.62cm) at the rear of the imager to allow adequate ventilation for camera cooling and access to the power cord and switch. In addition, allow sufficient space to open the front-facing imager door to place sample within the imager. Instrument dimensions are listed in Table 2-1.

Table 2-1. Imager dimensions.

Dimensions	Inches	Centimeters
Width	12.25	31.1
Depth	22	55.9
Height	21	53.3

Electrical Requirements

A grounded circuit capable of delivering the appropriate current and voltage is required for installation. Electrical requirements can be located on the imager label on the rear panel of the imager and in Table 2-2. The imager electrical system adjusts to the proper voltage for the respective country (Table 2-3). Connect the imager power cord to the rear left side panel of the system and plug into a grounded power outlet.

Table 2-2. Imager electrical ratings.

Electrical Parameter	Rating
Supply Voltage (VAC)	120-240
Frequency (Hz)	50-60
Power Rating (W)	120
Fuse (power center)	T4AL, 250V, 4A

Table 2-3. Imager electrical requirements for major countries.

Region	Voltage (VAC)	Frequency (Hz)	Amps (A)
US and Canada	120	60	1.0
Europe	220	50	0.5
UK	240	50	0.5
Japan	100	50	1.2
China	220	50	0.5
India	230	50	0.5
South Korea	220	60	0.5

Environmental Requirements

For optimal performance, maintain a constant laboratory temperature range of 15-25°C (59-77°F) with relative humidity between 15-70%. To allow adequate camera cooling, do not place the imager in direct sunlight.

Computer Requirements

The imager is operated by an integrated computer, which is accessed through the touchscreen.

The MYImageAnalysis Software program is included with the imager purchase. To run the MYImageAnalysis Software properly, workstations must meet the minimum performance requirements listed in Table 2-4.

Table 2-4. Recommended computer requirements for MYImageAnalysis Software.

Description	Recommended
Operating System	Windows 7, Vista*, or XP*
Processor	Pentium* 4 @ 2.4GHz
Memory (RAM)	512MB
Hard Drive	2GB
Screen Resolution	1280 × 1024†

† Refer to the MYImageAnalysis Software User Manual for more information.

Imager Images with Feature Locations

Imager Front View

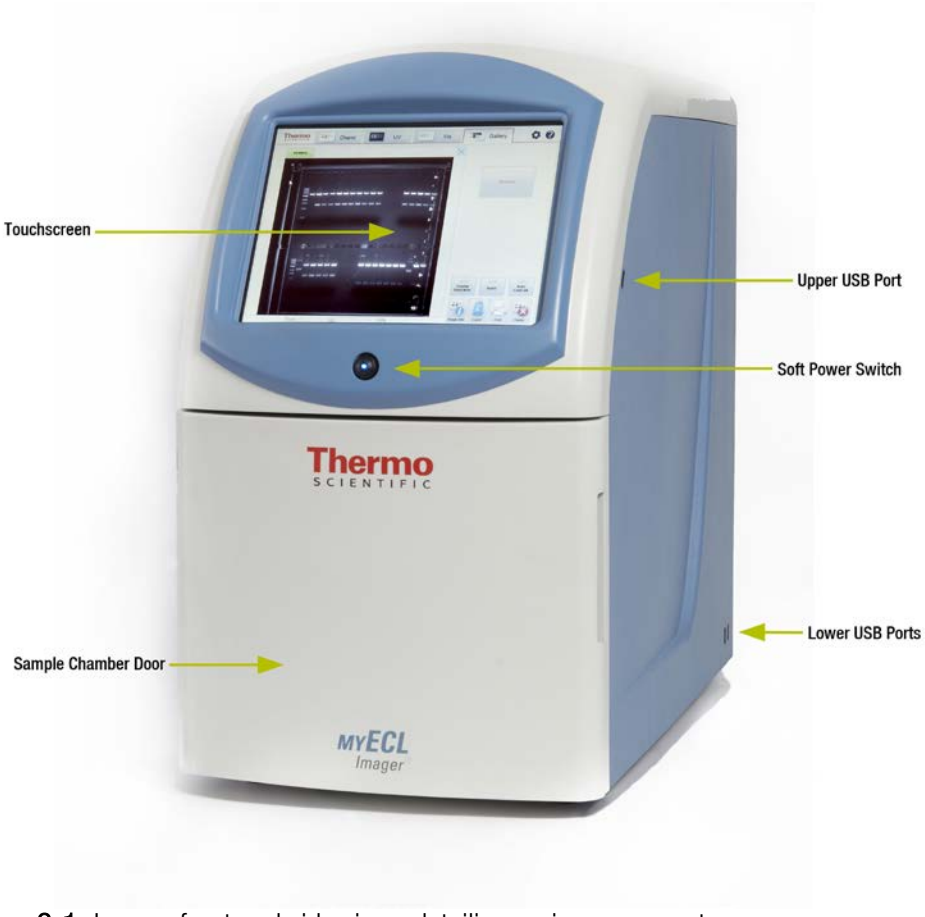


Figure 2-1. Imager front and side views detailing main components.

Imager Front View with Sample Door Open

Figure 2-2. Imager view with the sample door open and the transilluminator extended.

Imager Rear View

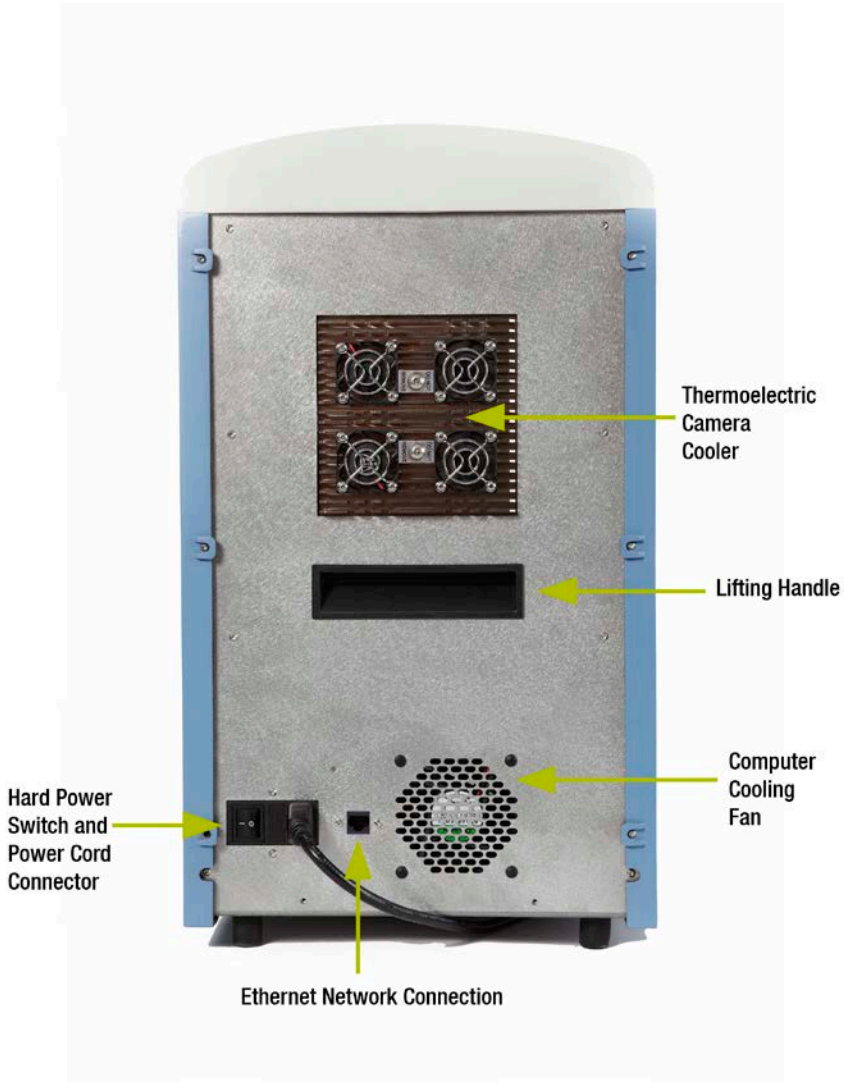


Figure 2-3. Rear imager view.

Start Up

IMPORTANT Allow the imager to equilibrate for 20-30 minutes after each initial hard power up. This ensures that the camera is optimally cooled before image acquisition.

Hard Start Up

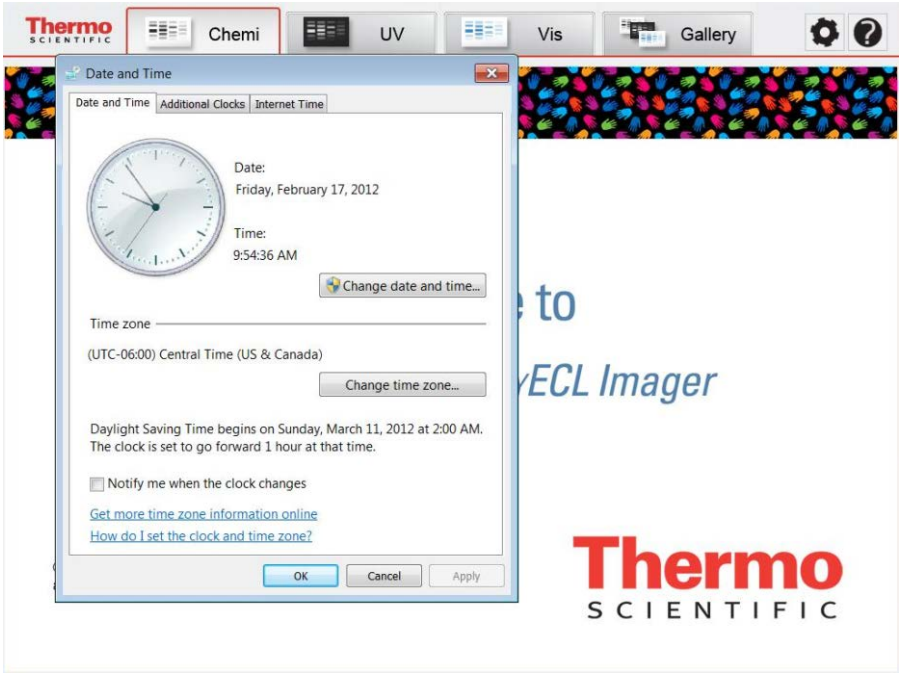
To perform the **Hard Start Up** procedure:

1. Turn on the **hard power switch** located at the bottom of the rear imager panel. The **hard power switch** provides power to all of the imager components.

2. Turn on the **soft power switch** on the front of the imager. This switch activates the internal computer, touchscreen and thermoelectric camera cooler.

3. The computer boots up.

4. The user is prompted to enter the current date, time and time zone. Upon completion, the screen automatically moves to the default Chemi acquire screen.



Soft Start Up

If the imager is powered down by the Soft Shut Down procedure, then a Soft Start Up can be done using the front, soft power switch. The soft power switch is the blue lighted switch located just above the front door and below the touchscreen. This switch allows the user power down the imager computer and touchscreen, while maintaining power to the camera cooling unit. This feature allows the user to power down the imager, but, once needed, quickly restart the imager without having to wait for the camera temperature to re-equilibrate.

1. Turn on the front soft power switch. The computer restarts and the touchscreen initiates with the default Chemi screen.

2. Begin normal operation of the imager.

Shut Down

Note For extended periods of inactivity, the imager can be hard powered off; however, for typical daily use, optimal camera temperature, and best image quality, avoid hard powering on and off the imager.

Soft Shut Down

The Soft Shut Down procedure uses only the front soft power switch.

1. Save any current image analyses.

2. Safely remove any USB flash drives.

3. Turn off the soft power switch.

4. The computer and touchscreen shut down and turn off. The fans continue running as needed. The camera cooler remains powered and continues to maintain the camera at the optimal -25°C.

5. The transilluminator and epi-white lights turn off.

Hard Shut Down

The Hard Shut Down procedure uses the hard power switch on the rear of the imager. This turns off all power to the imager, including the computer and camera cooler.

1. Follow the Soft Shut Down procedure.

2. Turn off the hard power switch at the rear of the imager.

USB Features

The three external USB ports on the right side of the imager can be used for flash drives, which can be connected through any of the USB ports for easy file management.

Note The Export button always exports files to the E:\ drive, which is automatically the first additional drive connected to the imager. When connecting an external hard drive to the imager, assign the external drive to a letter other than C, D or E.

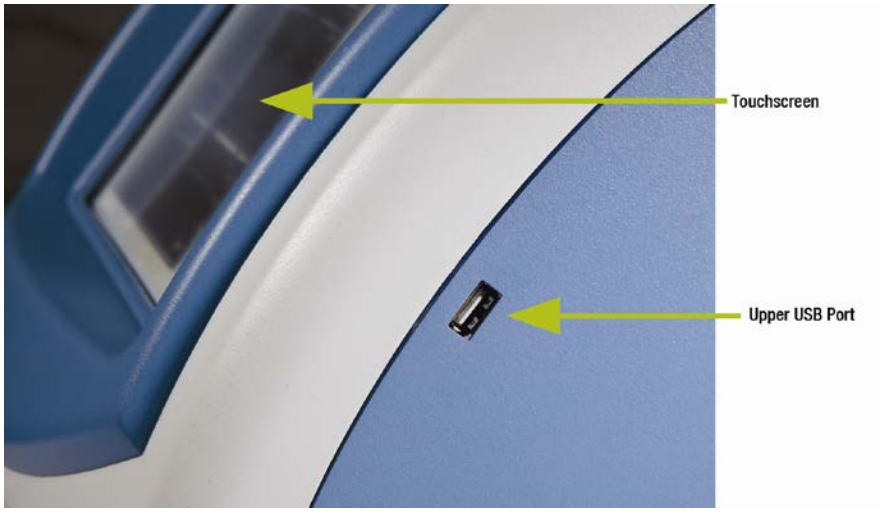


Figure 2-3. Location of upper USB port.

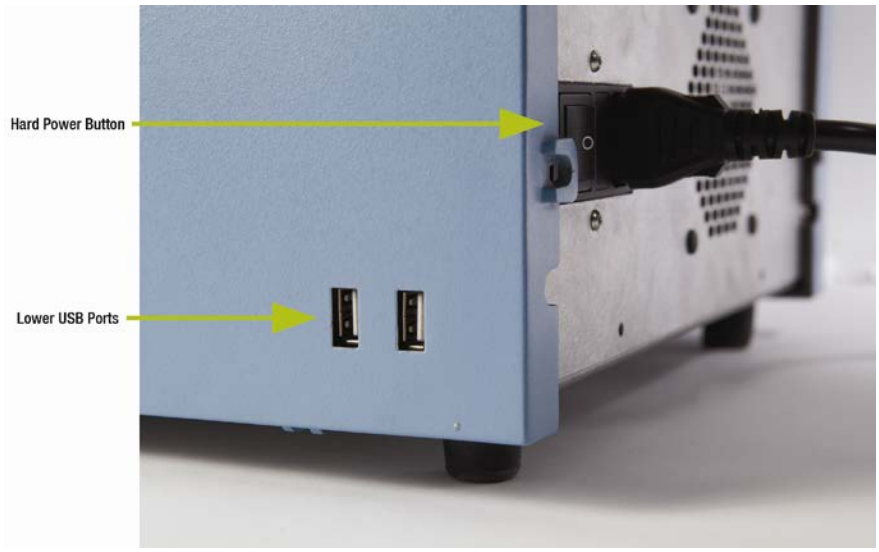


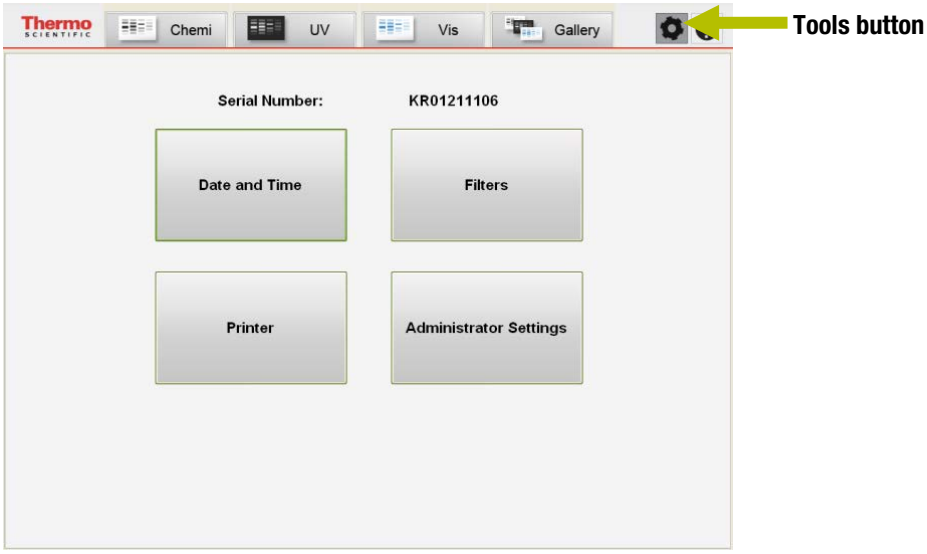
Figure 2-4. Location of lower USB ports.

Imager Settings

The **Tools** button in the top right corner of the acquisition software screen allows access to basic imager settings and functionality.

Tools

Select the **Tools** button to open the **Tools** screen.



The **Tools** screen displays the serial number of the system and the current software version installed in the system. Large buttons for **Date and Time**, **Printer**, **Filters**, and **Administrator Settings** are displayed on the screen. Select the appropriate button to enter setup for each item.

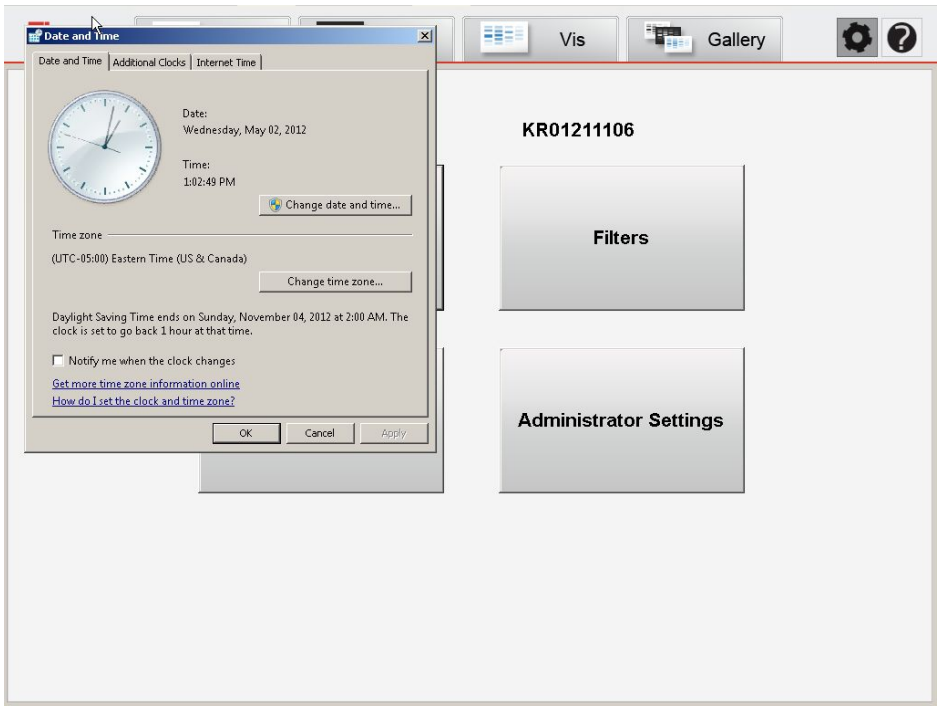
Date and Time

To correct the date, time or time zone:

1. Select the **Date and Time** button. A Windows clock and calendar is displayed.

2. Choose the correct settings as needed.

3. Select the **Apply** button, followed by the **OK** button to save the settings.

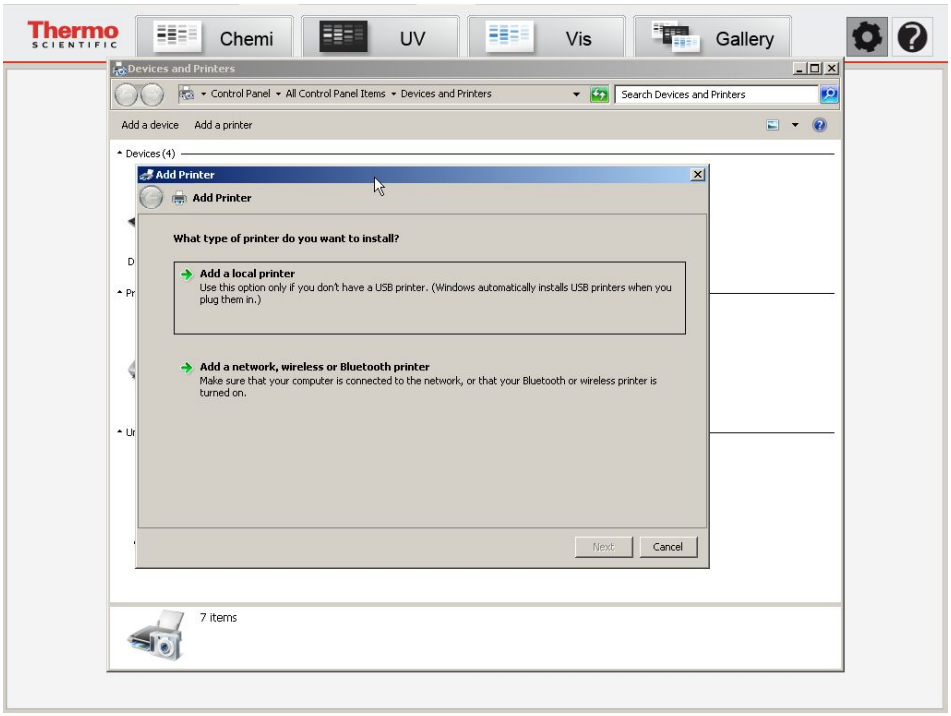


Printer To select a default printer for imager exporting:

1. Select the **Printer** button. A **Printers and Other Devices** screen is displayed.

2. Choose the appropriate printer from the listed selections. Plug-and-play printers automatically populate the list. Select **Add a Printer** from the left column if the printer is not a local printer or plug-and-play type. A network printer can also be selected as a default printer.

Note Consult your facility's IT department for assistance in setting up network printers.


Thermo SCIENTIFIC
Chemi
UV
Vis
Gallery
Devices and Printers
Control Panel ▸ All Control Panel Items ▸ Devices and Printers
Search Devices and Printers
Add a device
Add a printer
Devices (4)
Add Printer
Add Printer
What type of printer do you want to install?
Add a local printer
Use this option only if you don't have a USB printer. (Windows automatically installs USB printers when you plug them in.)
Add a network, wireless or Bluetooth printer
Make sure that your computer is connected to the network, or that your Bluetooth or wireless printer is turned on.
Next
Cancel
7 items

Filters

The imager has four default filter positions:

Position 1: No filter (for use in **Chemi** applications)

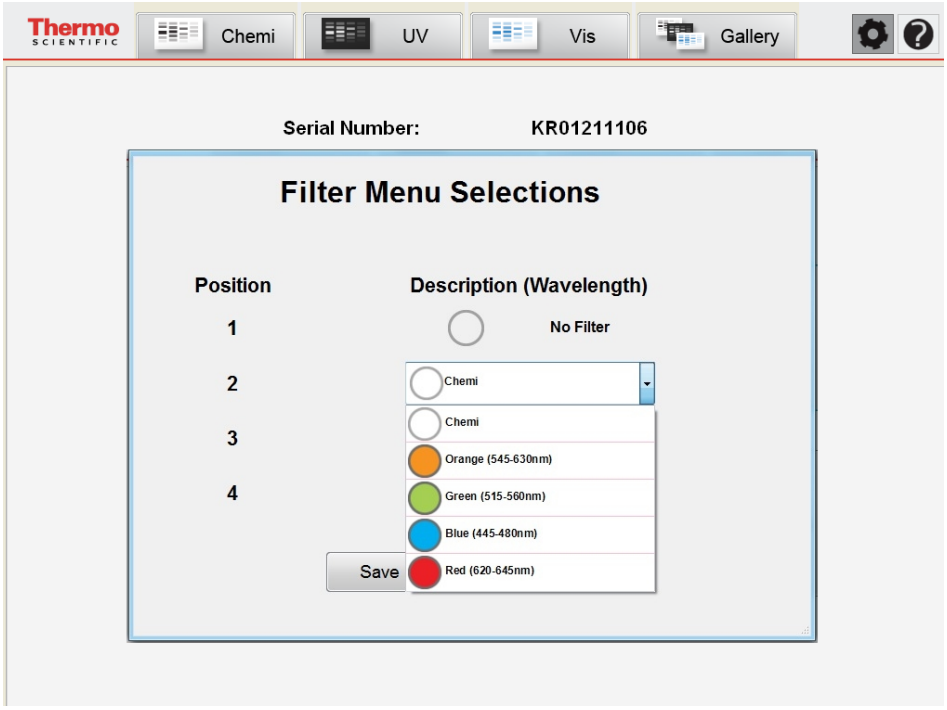
Position 2: Orange filter (for use in **UV** and **Vis** applications)

Position 3: No filter

Position 4: No filter

The imager is supplied with an orange filter in **Position 2**, but green, red and blue filters can also be purchased for additional applications. Install additional filters into **Positions 3** and **4**. Assign filters to the different positions in the **Filter Menu Selections** in the **Tools** menu.

1. Select the **Filters** button. The following menu appears:



2. **Positions 2, 3** and **4** use selectable drop-down menus to enable filter assignment: **Chemi (empty), Orange, Green, Blue** and **Red**. Select the choice for each filter position.

3. When complete, select the **Save** button at the bottom of the menu to save the changed defaults.

Table 2-5. Imager filter specifications and corresponding dyes.

Filter Color	Wavelength Range (nm)	Compatible Dyes and Stains	Sample Screen
Blue	445-480	DAPI	Clear screen
		AMCA	Clear screen
Green	515-560	SYBR* Green	Clear screen
		SYBR Gold	Clear screen
Orange	545-630	Ethidium Bromide	Clear screen
		Hoechst Blue[§]	Clear screen
		Coomassie Blue	White screen[†]
		Imperial*	White screen[†]
Red	620-645	SYPRO* Ruby	Clear screen
		Deep Purple*	Clear screen

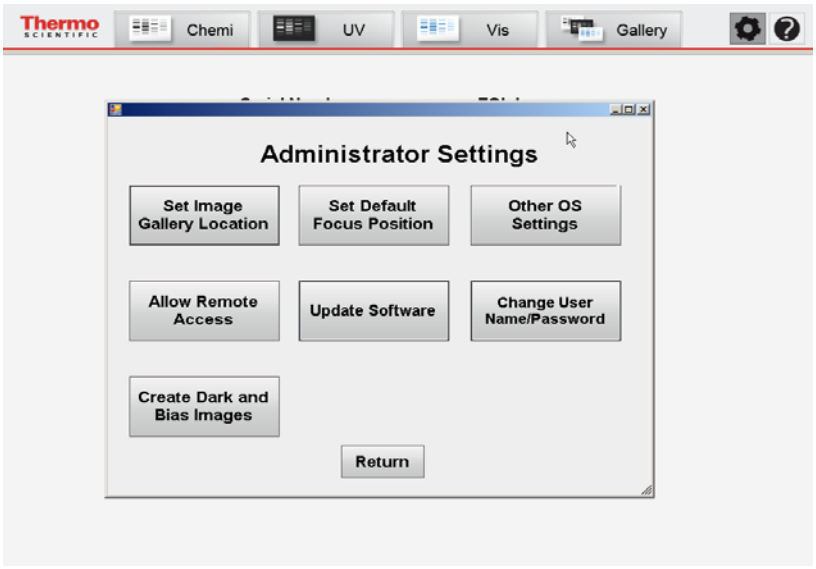
[§] With the MYECL Imager, the orange filter is optimal for Hoechst Blue imaging.

[†] Coomassie Blue and Thermo Scientific Imperial Stains do not require the orange filter; however, these stains require the white light conversion screen. UV and Vis modes use the orange filter in Position 2 by default.

Administrator Settings

Selection of **Administrator Settings** displays the following screen requiring a **User Name** and **Password**. Only the designated administrator should access this section.

Users do not typically need to access **Administrator Settings**. Only the facility administrator should have access to these functions through password access. The default user name and password are **myecl** and **1234**, respectively. To avoid improper access, the designated administrator needs to change this username and password once the imager is installed. To change the password, select the **Change User Name/Password** button.



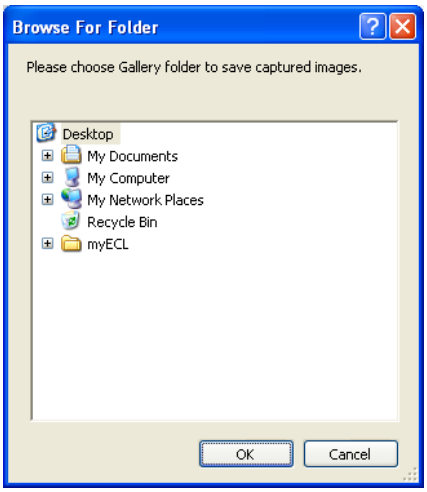
Set Image Gallery Location

The **Set Image Gallery Location** button allows the administrator to set up a default pathway for saving acquired images. The imager has a default image gallery location, “Computer – Local Disk (D:\) – Gallery_1”. The image gallery location can be changed to another folder in a local or network drive. When **Set Image Gallery Location** is selected, the program automatically creates a “Gallery_1” folder if there are no previously saved gallery folders in the selected folder.

1. Select the **Set Image Gallery Location** button.

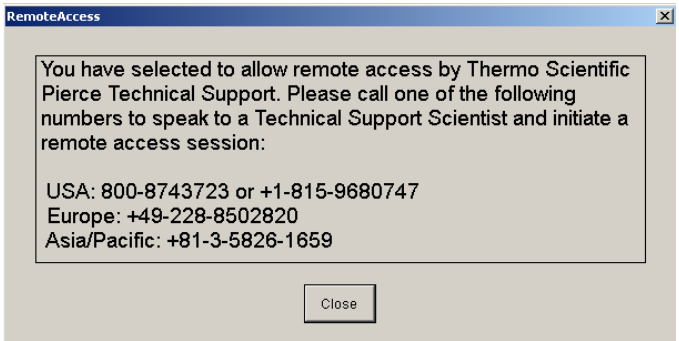
2. Browse for the appropriate gallery location using the folder menu.

3. Select **OK** after choosing the appropriate storage location.



Allow Remote Access

Remote access for maintenance and troubleshooting is possible with the imager. After selecting the **Allow Remote Access** button, the administrator views the following screen:


RemoteAccess
You have selected to allow remote access by Thermo Scientific Pierce Technical Support. Please call one of the following numbers to speak to a Technical Support Scientist and initiate a remote access session:
USA: 800-8743723 or +1-815-9680747
Europe: +49-228-8502820
Asia/Pacific: +81-3-5826-1659
Close

Follow the instructions provided and contact our Technical Support team for questions or to troubleshoot the imager.

U.S. contact: 800-874-3723

International contact: +1-815-968-0747

Europe contact: +49-228-8502820

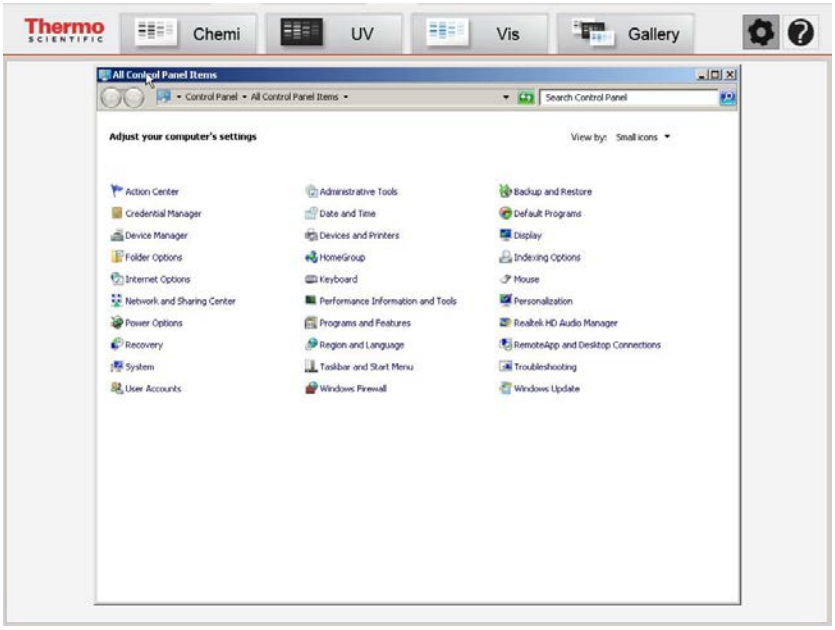
Asia/Pacific contact: +81-3-5826-1659

Note Remote access requires the imager to be connected to a network with internet access. Contact your facility's IT department regarding correct set up and use of network connections.

Other OS Settings

This function allows the administrator to access the Windows Control Panel to change system and user configurations as needed.

Note Only qualified administrators should have access to this area. Altering configurations can cause imager errors.



Reset Default Focus Position

The default focus position can be reset or changed by selecting the Reset Default Focus Position button. The focus position may need resetting if the current default focus position does not provide in-focus images. The administrator can control this position by going to Tools > Administrator Settings > Reset Default Focus Position and using the slider bar to focus in or out to achieve the required sharpness in Chemi, UV and Vis modes.

Update Software

This function installs and updates the acquisition software when a program update becomes available.

Change Username and Password

This function allows the administrator to change the username and password for accessing the administrator settings.

Create Dark and Bias Images

Dark current is the thermal noise generated from a CCD (charge coupled device). This thermal noise is proportional to a power law of CCD temperature. The bias noise is introduced as the analog signal is converted to a digital signal. The MYECL Imager applies dark and bias noise compensation using dark and bias masters upon image acquisition.

This function allows the administrator to create new dark and bias master files. Dark and bias masters need to be updated only when strong CCD noise appears on acquired images. It takes ~14 hours to create all of the dark and bias masters in the system; therefore, creation of new dark and bias masters is best accomplished by beginning the process at the end of the day and allowing the masters to be created overnight.

1. Select the **Tools** button.

2. Select the **Administrator Settings** button. Enter the User Name and Password. Select the **Login** button.

3. Select the **Create Dark and Bias Images** button. The following screen is displayed:

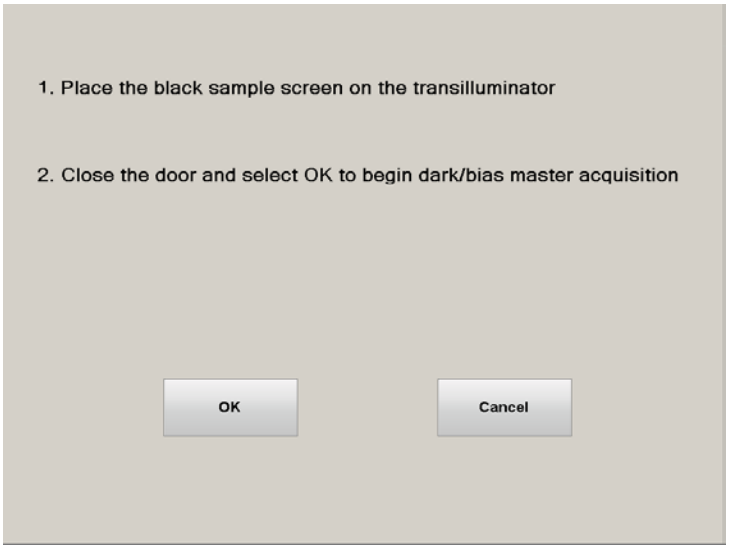
Dark and bias masters created 2/13/2013.
Dark and bias image collection requires approximately 14 hours, 12 minutes, 34 seconds.
Create bias masters
Create dark masters
Start
Cancel

4. Select **Start**. To create only dark or only bias masters, choose the corresponding check box next to the desired selection.

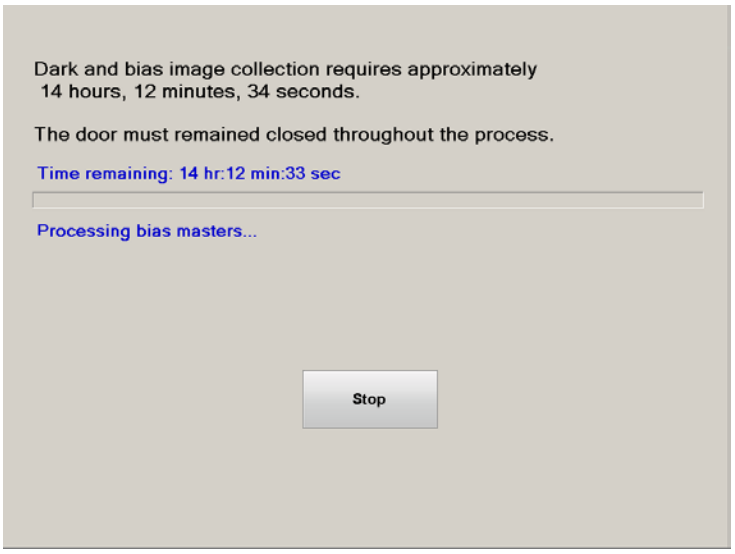
   Note Select the **Cancel** button to return to the **Administrator Settings** screen.

5. Place the black sample screen on the transilluminator and close the door.

6. Select **OK** to begin or **Cancel** to return to the **Administrator Settings** screen.


1. Place the black sample screen on the transilluminator
2. Close the door and select OK to begin dark/bias master acquisition
OK
Cancel

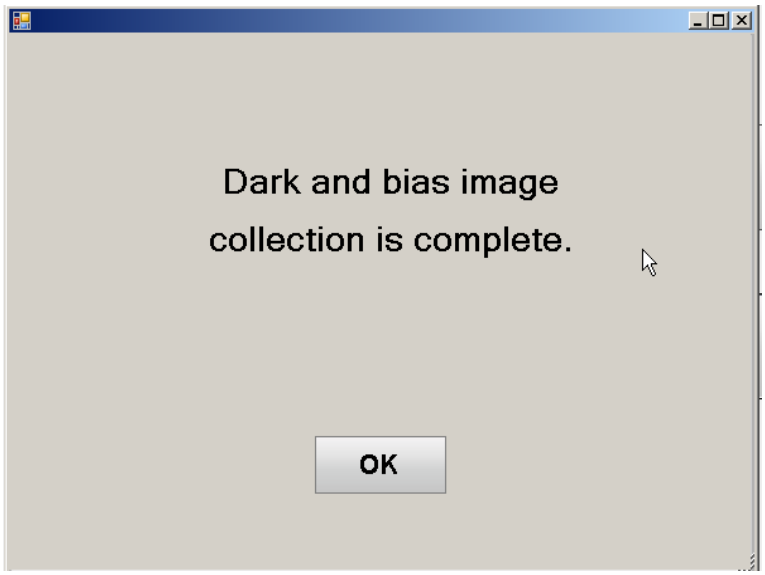
7. Select **OK**. The following screen will appear:


Dark and bias image collection requires approximately
14 hours, 12 minutes, 34 seconds.
The door must remained closed throughout the process.
Time remaining: 14 hr:12 min:33 sec
Processing bias masters...
Stop

Note To avoid inaccurate dark and bias master creation, the door must remain closed during the entire dark and bias image acquisition process.

Note Interruption of dark and bias master creation by opening the door or selecting the Stop button stops the process and discards all acquired masters. In this case, previous dark and bias masters are used for subsequent image acquisition.

8. Once the dark and bias image acquisition process is complete, the following screen appears:



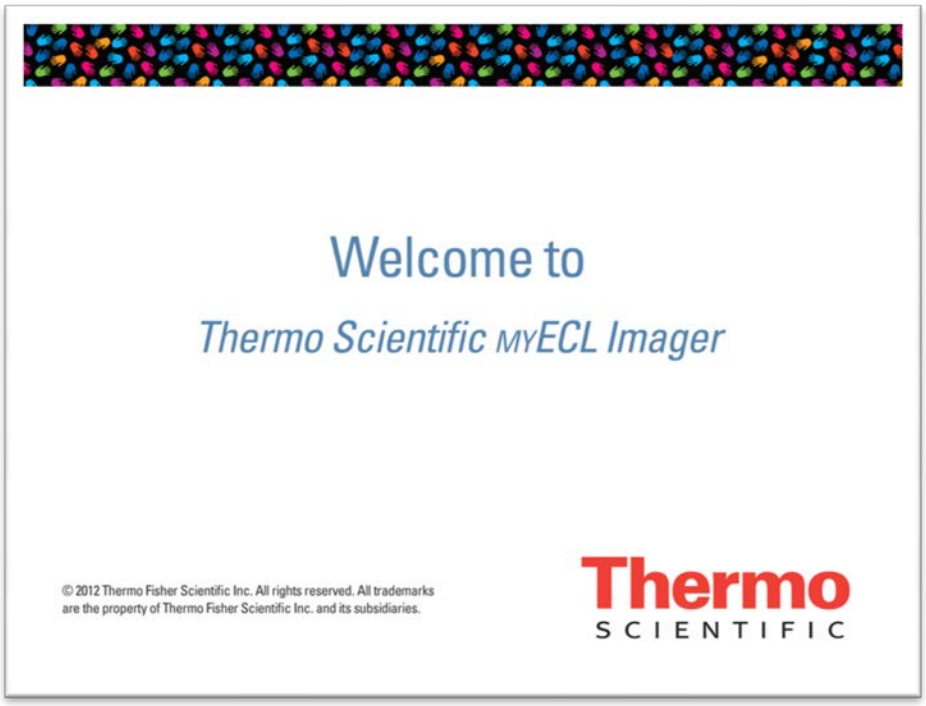
9. Select **OK** to return to the **Administrator Settings** screen.

Return Select **Return** to return to the previous **Tools** menu.

Chapter 3 Image Acquisition

Imager Settings

Upon powering up the imager, the **MYECL Imager welcome screen** is displayed.


Welcome to
Thermo Scientific MYECL Imager
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Thermo
SCIENTIFIC

Note When performing the **Hard Start Up** procedure, the thermoelectric camera cooler is **NOT** at the ideal temperature of -25°C. After powering up the imager, allow 10-30 minutes for the camera to cool to the optimal temperature.

Live Camera

Enabling the **Live Camera** button displays the streaming image from the camera and allows access to **Camera Settings** (**Focus**, **Aperture**, **Resolution/Sensitivity**, **Filter** and **Digital Zoom**). Disabling the **Live Camera** button displays previously acquired images. Opening the imager door enables **Live Camera** and turns on the epi-white lights. Refresh rate of live image display depends on the binning setting selected in **Resolution/Sensitivity** (greater resolution requires more time to display).

Live Camera in Chemi Mode

Selection of **Live Camera** in **Chemi** mode turns on the epi-white lights. ChemiV images are captured and saved to the **Gallery**; however, they are not displayed in the image tab if **Live Camera** is not enabled before image acquisition in **Chemi** mode.

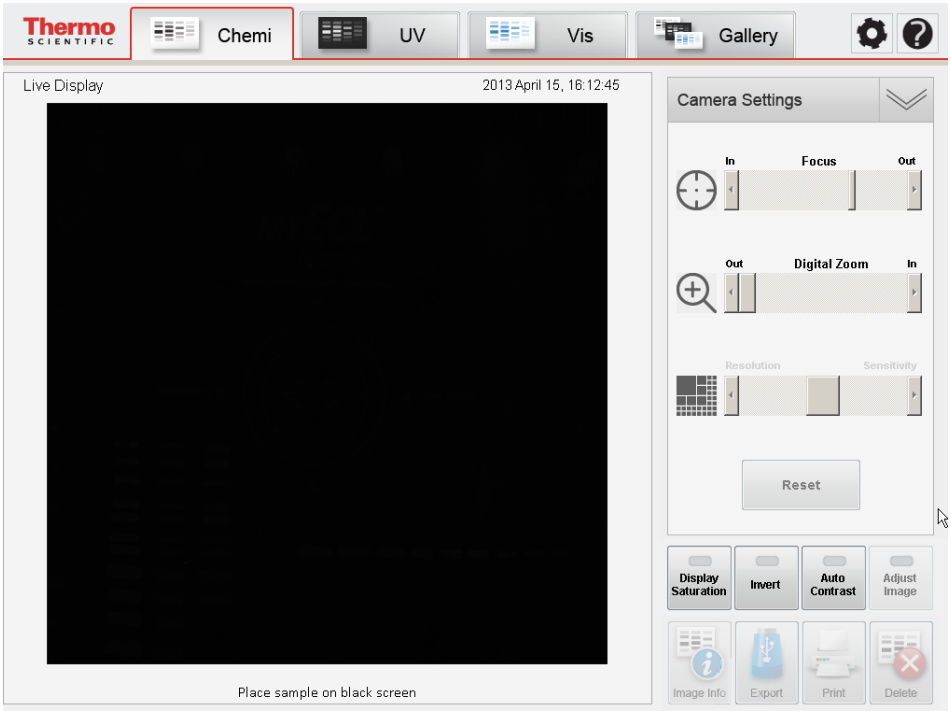
Live Camera in UV Mode

Selection of **Live Camera** in **UV** mode turns on the UV light. The live image is displayed with the exposure time used in the previous image acquisition in **UV** mode unless the user changes the exposure time or changes the mode.

Live Camera in Vis Mode

Selection of **Live Camera** in **Vis** mode turns on the UV and epi-white lights. The live image is displayed with the exposure time used in the previous image acquisition in **Vis** mode unless the user changes the exposure time or changes the mode.

Camera Settings Available in Chemi, UV and Vis Modes



Note **Camera Settings** are only available with the live image display

Focus Icon for performing minimal focusing adjustments that may be needed as varying object depths change.

Note An Imaging Reference Target is supplied with the imager. Use this target when performing camera focusing.

Digital Zoom Icon for **increasing** the camera zoom level. Slider bars appear after **increasing** the zoom level to center the image acquisition area. Image acquisition with **Digital Zoom** results in capture of the zoomed image.

Resolution/Sensitivity Icon for adjusting the camera image sensor's degree of response to light; the number of camera pixels used to capture an image. To enhance detection sensitivity, the pixels, or light capturing units of the CCD chip, can be combined or binned. The process of binning bundles multiple pixels, which effectively increases the amount of light collected. Figure 3-1illustrates the binning process using 7µm pixels as examples for 1×1, 2×2 and 3×3 binning settings.

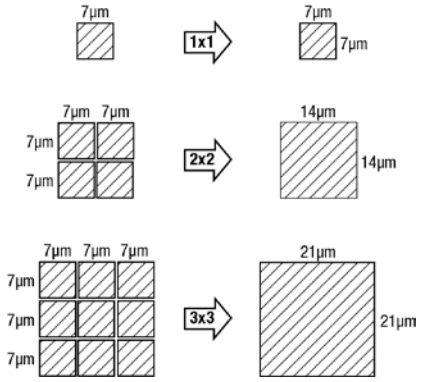


Figure 3-1. The binning process.

The **Resolution/Sensitivity** selection allows for choosing among five different sensitivities: 1×1 (far left setting), 2×2, 3×3 (middle, default setting), 4×4 and 8×8 (far right setting) binning. Selection of 1×1 binning provides minimum sensitivity/maximum resolution, while selection of 8×8 binning provides maximum sensitivity/minimum resolution. Table 3-1 provides multiple specifications related to the varied binning sizes.

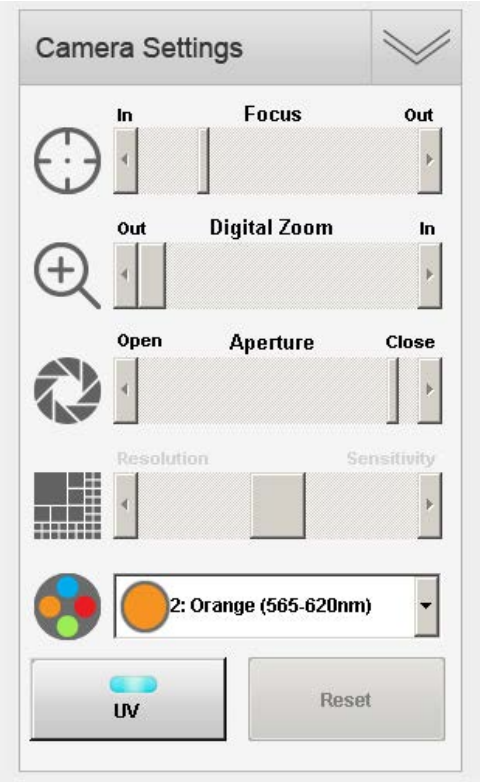
Table 3-1. Binning specifications for sensitivity settings.

Binning	Size (kb)	PPI (pixels/ inch)	Pixel × Pixel	Image size (inches × inches)	Image size (mm × mm)
1 × 1	8197	300	2048 × 2048	6.8 × 6.8	173.4 × 173.4
2 × 2	2050	300	1024 × 1024	3.4 × 3.4	86.7 × 86.7
3 × 3†	910	300	682 × 682	2.3 × 2.3	57.7 × 57.7
4 × 4	513	300	512 × 512	1.7 × 1.7	43.3 × 43.3
8 × 8	129	300	256 × 256	0.9 × 0.9	21.7 × 21.7

† 3 × 3 binning in 16-bit grayscale .tiff image files are the default settings for the imager.

Reset Button used to reset all imager settings to their default values.

Settings Only Available in UV and Vis Modes

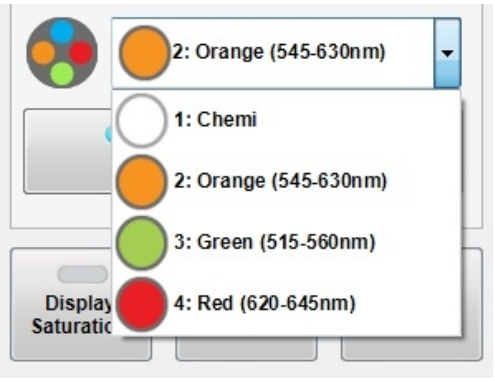


Aperture Slider bar for adjusting the camera lens opening to control sensitivity and depth of field. The aperture can be fully closed (far right position) or fully opened (far left position) depending on the light sensitivity needed.

UV Light Button for turning on/off the transilluminator UV bulbs.

Filter Wheel Position Drop-down menu for moving the filter wheel position to switch filters.

Note Filter Wheel Positions 2-4 can be set for different filter colors by accessing **Tools > Filters.**



Chemiluminescence (Chemi) Mode

Chemiluminescence (Chemi) Mode is the default mode. **Chemi** mode is used for the capture of sample images using sample-emitted light. A visible image of the sample is automatically captured in **Chemi** mode using reflected light (ChemiV image), which is useful for imaging colorimetric molecular weight markers.

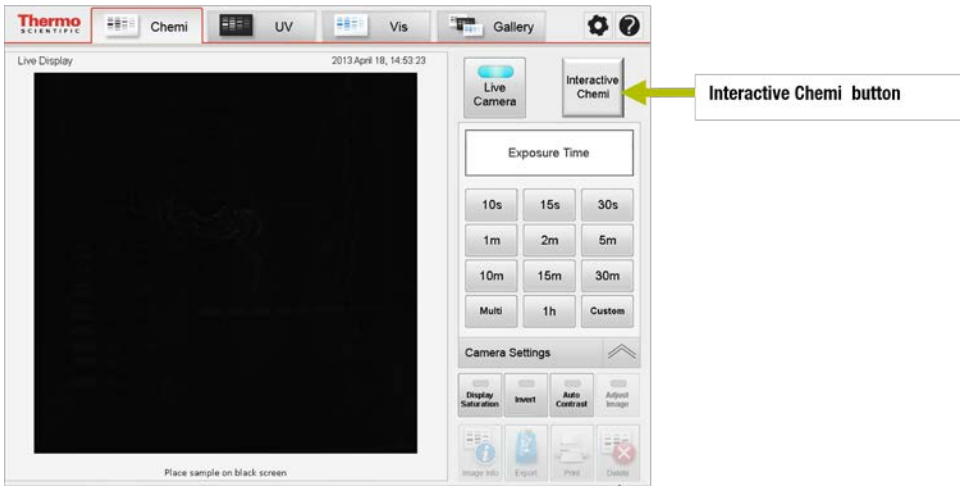
Camera Settings

Focus, Digital Zoom and **Resolution/Sensitivity** camera settings are available in **Chemi** mode.

Interactive Chemi

Interactive Chemi is a patent-pending interactive tool used to evaluate and optimize imaging exposure time before acquiring a Western blot image. The **Interactive Chemi** button automatically calculates the exposure time of the Western blot with maximum dynamic range and minimal pixel saturation from a short exposure image. The feature displays real-time changes of the calculated Western blot image with adjusted exposure time and allows further exposure-time refinement through user input.

1. Select the **Interactive Chemi** button. The imager acquires a 15-second exposure.



Note A **Stop** button appears over the keypad area once the **Interactive Chemi** button is selected. Image acquisition can be stopped by selecting the **Stop** button.

2. The imager calculates and displays the exposure time with maximum dynamic range and minimum pixel saturation. The slider bar location and **Time Display/Input** button correspond to the calculated exposure time.

   Note Exposure time ranges from 1 second to 99 minutes 99 seconds. If the 15-second sample image is saturated, then the imager automatically sets the calculated exposure time to 5 seconds.

3. Use the exposure time slider bar and updated image preview to obtain the desired exposure time. Drag and release the slider bar to update the image preview. Alternatively, select the **Time Display/Input** button to enter a custom exposure time that updates the image preview and slider bar location.

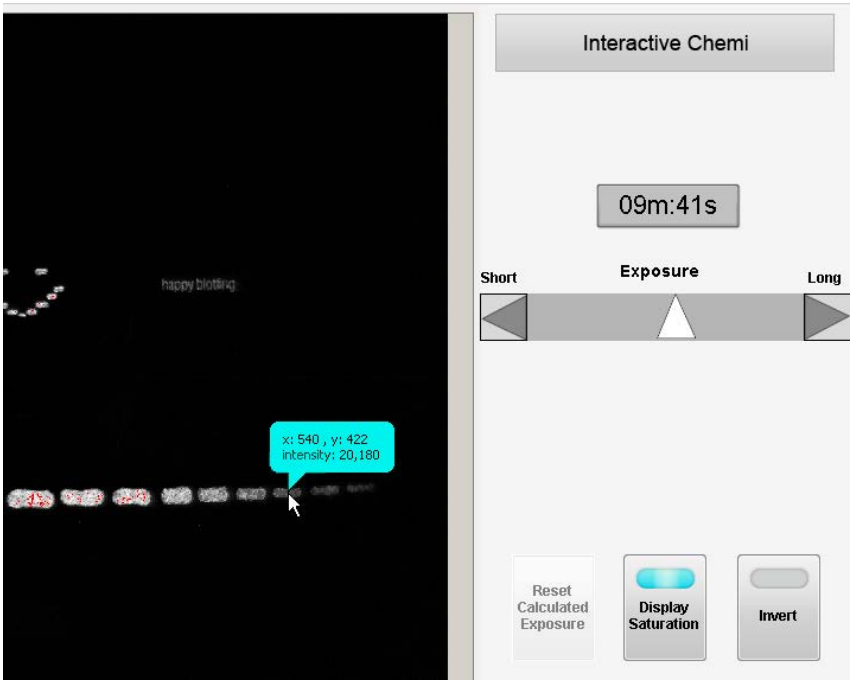
   Note Once a number is selected, the **Enter** button is enabled and the **Cancel** button becomes a **Clear** button. Select **Enter** or the **Time Display/Input** button to accept the exposure time.

4. Select the **Reset Calculated Exposure** button to return to the imager calculated exposure time.

Note The **Invert** button is a useful tool for viewing faint gel bands. This tool inverts the standard black background with white highlights to a white background with black highlights. The inverted image can be switched back to the standard image by again selecting the **Invert** button.

Note The **Display Saturation** button is automatically selected in **Interactive Chemi** to highlight the image pixels that are considered saturated (a red false-color is superimposed on the pixels deemed to be saturated). Adjustment to the saturation can be done by adjusting the exposure time with the slider bar or **Time Display/Input** button. Select the **Display Saturation** button to turn off the false-color imaging.

5. (Optional) Select the point of interest on the image to display the estimated pixel intensity of the corresponding pixel coordinates. The displayed pixel intensity (estimated) is updated when the exposure time is further adjusted.



6. Select the **Acquire** button to capture an image with the indicated exposure time.

7. Select the **Cancel** button to return to **Chemi** mode.

Capture Settings

Single Image Acquisition

1. Select the **Chemi** tab on the touchscreen.
2. (Optional) Select the **Live Camera** button if the live image is not displayed.
3. The epi-white lights and live image display are activated. Open the imager door, pull out the transilluminator and install the chemiluminescence exposure screen (black) on the transilluminator glass.
4. Insert and center the sample on top of the chemiluminescence exposure screen (black) using the live image display for reference.
5. Close the imager door.
6. While viewing the live image, adjust the settings for **Focus**, **Digital Zoom** and **Resolution/Sensitivity** in the **Camera Settings**, if needed.

   Note **Camera Settings** are available only with the live image display.

7. Select a pre-set or custom exposure time.

Note ChemiV images are captured and automatically saved to the **Gallery**; however, they are not displayed in the image tab if **Live Camera** is not enabled before image acquisition in **Chemi** mode. Saved ChemiV images can be displayed in **Gallery** mode along with the Chemi images.

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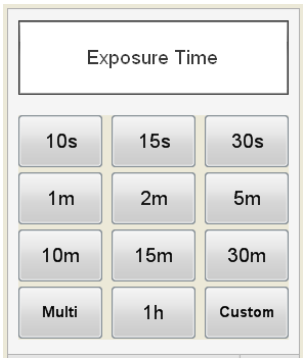
Pre-set Exposure Time

1. Select one of the pre-set exposure time buttons on the touchscreen keypad. The imager takes an image as soon as the exposure time button is selected.



2. Captured images are displayed on the screen and automatically stored in the **Gallery** for further review and selection.

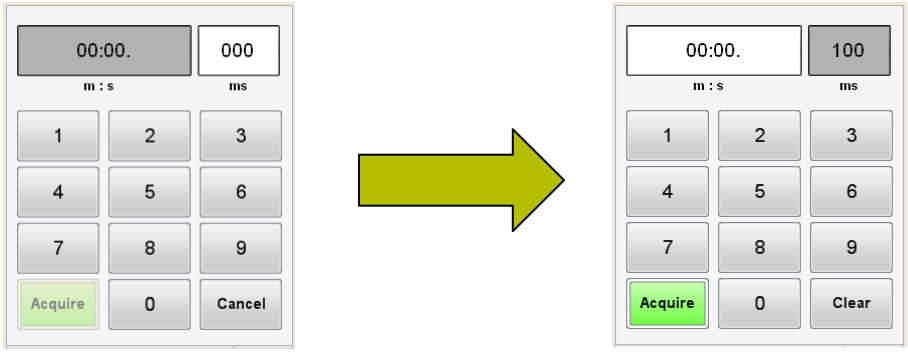
Note A **Stop** button appears over the keypad area once an exposure time button is selected. Image acquisition can be stopped by selecting the **Stop** button.

Note Up to six recent images can be displayed on the touchscreen.

Custom Exposure Time

1. Select the **Custom** exposure button using the touchscreen keypad.

2. Enter the desired time in milliseconds (ms), seconds (s) or minutes (m) using the touchscreen keypad numbers. The **m : s** box is used to input seconds and/or minutes and is active by default (box is gray in color). For a custom exposure time of <1 second, select the **ms** box to input milliseconds. The shortest exposure time that can be entered is 10 milliseconds; selecting "**1**" from the keypad appears as "**10**" in the **ms** box.



3. Once a number is selected, the lower **Cancel** button becomes a **Clear** button. Use this to remove entered numbers.

   Note Selecting the Cancel button returns the custom exposure time keypad to the pre-set exposure time keypad.

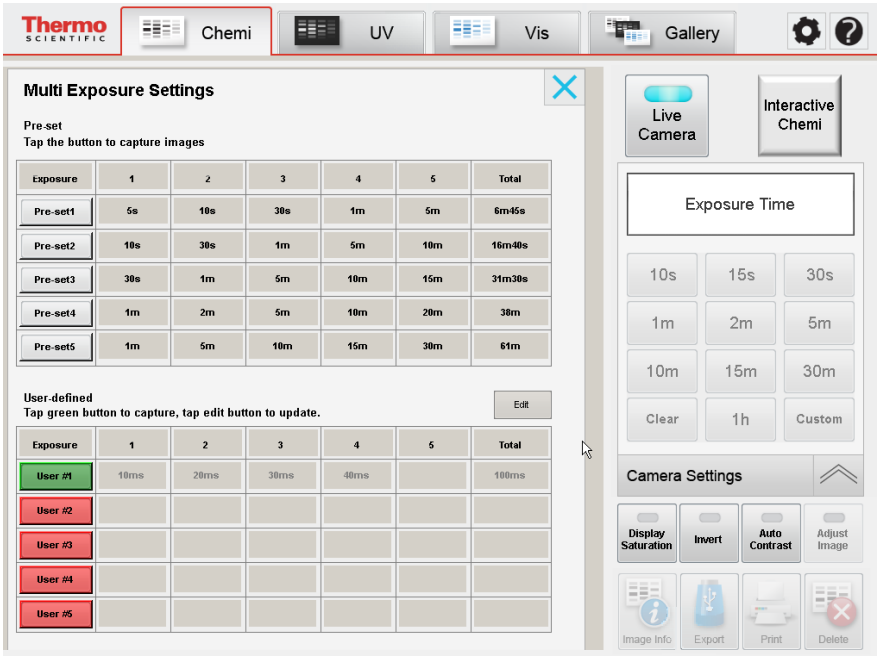
4. Select the **Acquire** button to capture the image.

5. The image displays in a tab on the touchscreen and is saved to the **Gallery**.

Note A **Stop** button appears over the keypad once the **Acquire** button is selected. Image acquisition can be stopped by selecting the **Stop** button.

Note Up to six recent images can be displayed on the touchscreen.

Multiple Image Acquisition



1. Select the **Chemi** tab.

2. (Optional) Select the **Live Camera** button if the live image is not displayed.

3. The epi-white lights and live image display are activated. Open the imager door, pull out the transilluminator and install the chemiluminescence exposure screen (black) on the transilluminator glass.

4. Insert and center the sample on top of the chemiluminescence exposure screen (black) using the live image display for reference.

5. Once the sample is centered, close the imager door.

6. While viewing the live image, adjust the settings for **Focus**, **Digital Zoom** and **Resolution/Sensitivity** in the **Camera Settings** menu, if needed.

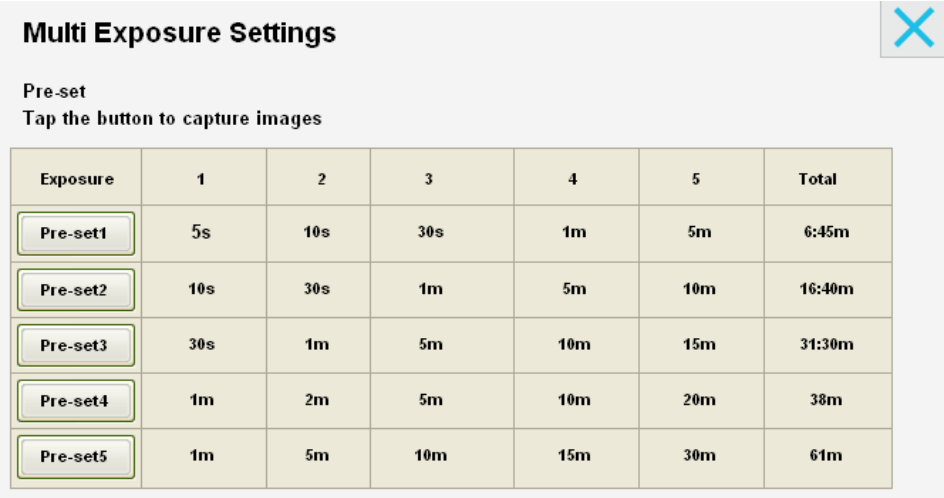
   Note **Camera Settings** are available only with the live image display.

7. Select a pre-set or user-defined multiple exposure time.

   Note A **Stop** button appears over the keypad once the **Acquire** button is selected. Image acquisition can be stopped by selecting the **Stop** button.

Pre-set Multiple Exposure Settings

The five pre-set multiple exposure settings allow you to select a time series of exposures.

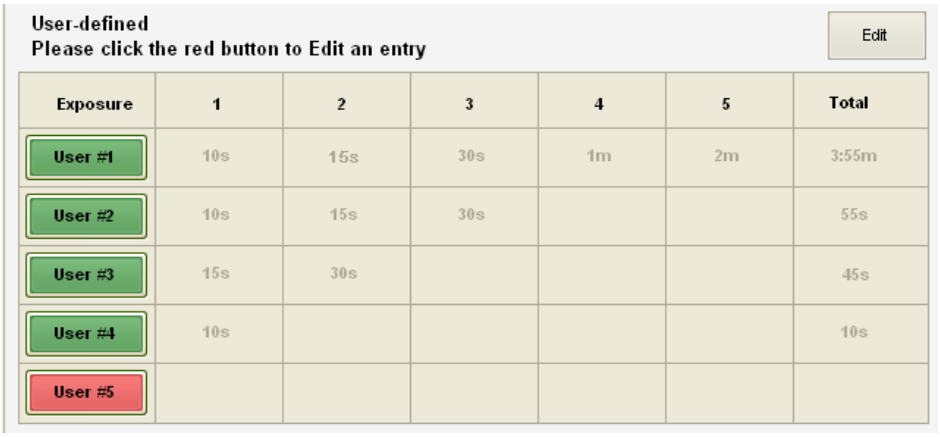


Exposure	1	2	3	4	5	Total
Pre-set1	5s	10s	30s	1m	5m	6:45m
Pre-set2	10s	30s	1m	5m	10m	16:40m
Pre-set3	30s	1m	5m	10m	15m	31:30m
Pre-set4	1m	2m	5m	10m	20m	38m
Pre-set5	1m	5m	10m	15m	30m	61m

1. Select the **Multi** button from the touchscreen number keypad.
2. Select one of the **Pre-set #** option buttons with an appropriate time series of exposures.
3. The images are automatically acquired.
4. Captured images are displayed on the screen and stored in the **Gallery** for further viewing and selection.

User-defined Multiple Exposure Settings

The **User-defined Multiple Exposure** settings allow the user to set custom times in situations where the pre-set exposure times do not meet your needs.

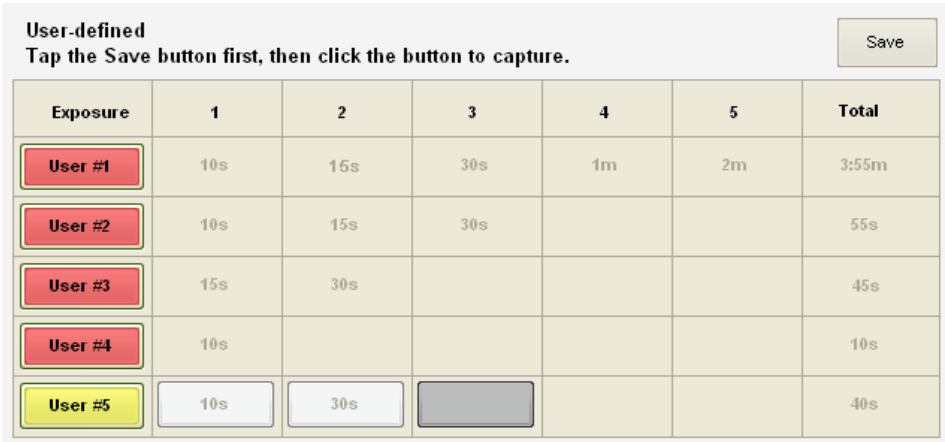


1. Select the **Multi** button from the touchscreen number keypad.

2. To create or edit the user-defined exposure time settings, select the **Edit** button to highlight the five **Exposure** fields.

3. Choose one of the **User #** option buttons to highlight the set of cells for user input.

4. Using the pre-set or custom exposure time keypad, input the desired time into each cell. The highlighted cell moves to the right as each time is input.



5. The **Total** time is calculated and displayed as each new time is input into a cell.

6. After all desired exposure times are entered, select the **Save** button (former **Edit** button) in the top right corner of the table. This saves the **User #** time settings for further uses. All five **User #** time settings are entered and saved the same way.

7. Select the **User #** button to automatically capture the images.

8. Captured images are displayed on the touchscreen and stored in the **Gallery** for further viewing and selection.

Image Tools

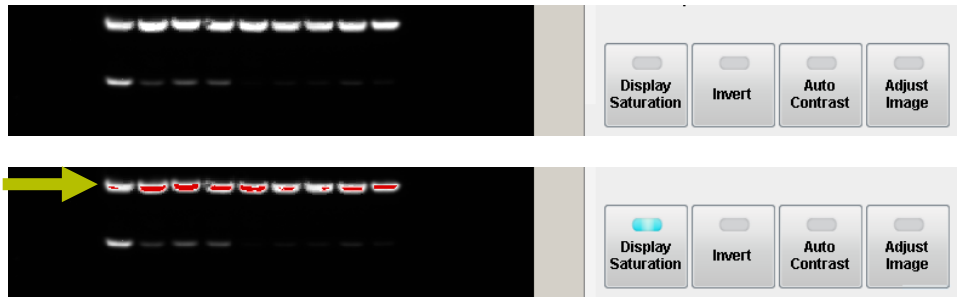
Note The Image Tools only function while viewing or printing the image. **Display Saturation, Invert**, **Auto Contrast** and **Adjust Image** adjustments are NOT saved with the image file.

Display Saturation

In **Chemi** mode, after capturing an image, the **Display Saturation** button can be selected to highlight image areas that are considered to be saturated. A red false-color is superimposed on the areas deemed to be saturated. Adjustment to the saturation can be done by adjusting the exposure time for subsequent images. Shorter exposure times reduce the light exposure/saturation.

1. After capture of an image, select the **Display Saturation** button under the time keypad.

2. The screen displays the saturated pixels on the image with a red false-color.



If the image appears to be over- or under-saturated, the image exposure time may need to be increased or decreased to acquire a properly saturated image. Exposure time can be adjusted for subsequent image capture by using the number keypad.

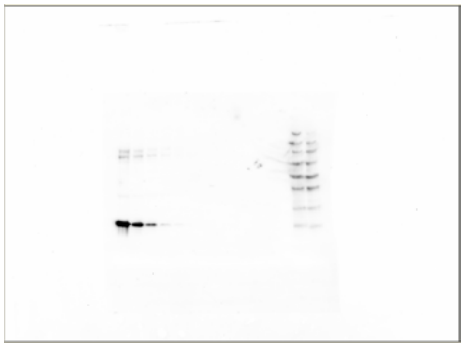
3. The **Display Saturation** button can be selected again to turn off the false-color imaging.

   Note The **Display Saturation** button is disabled when the **Auto Contrast** or **Adjust Image** functions are enabled.

Invert Image

The **Invert** button is a useful tool for viewing faint gel bands. This tool inverts the standard black background with white highlights to a white background with black highlights or vice versa.

Original Chemi Image



Inverted Chemi Image

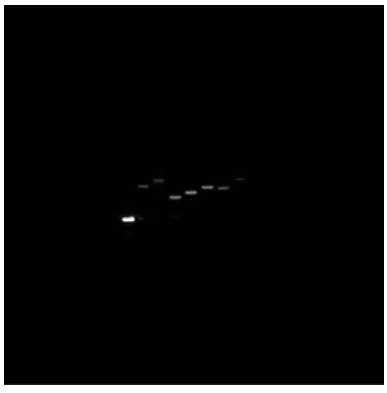
1. In the active live image or acquired image, select the **Invert** button under the time keypad.

2. The inverted image can be reverted to the standard image by again selecting the **Invert** button.

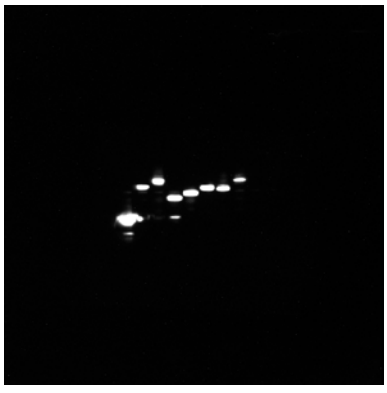
Auto Contrast

Selecting the **Auto Contrast** button increases the contrast between the signal and the background to increase visibility. This adjustment can only be used for viewing or printing the image. The contrast adjustment is NOT saved with the image file.

Note Auto Contrast is disengaged when the **Adjust Image** button is selected.



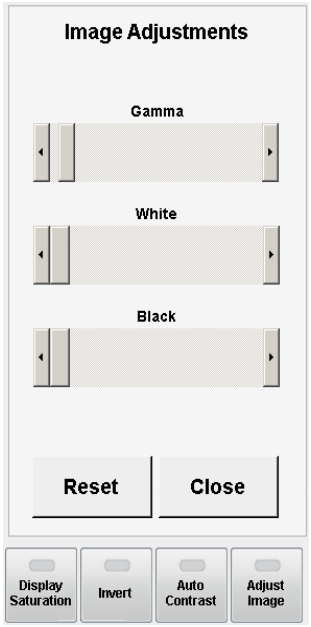
Original Chemi Image



Auto Contrast Adjusted Chemi Image

Adjust Image

Select the **Adjust Image** button to modify the **Black**, **White** and **Gamma** levels of the image to increase sample visibility. This adjustment is only used for viewing or printing the image. Image adjustments are NOT saved with the image file.

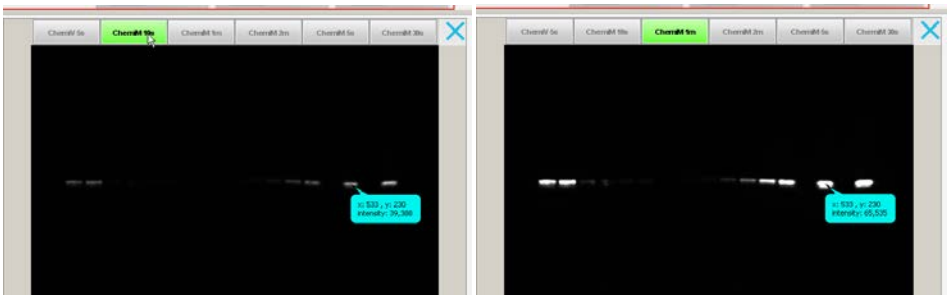


Select the **Reset** button to restore **Black**, **White** and **Gamma** to original levels. Select the **Close** button to return to the previous screen.

Note **Adjust Image** is disengaged when the **Auto Contrast** button is selected.

Intensity Display

Select a point of interest on the acquired image to view the **Intensity Display** containing the pixel intensity and pixel coordinates of the corresponding region. When multiple images of the same sample are acquired and displayed on the screen, the pixel intensities of the same location can be viewed and compared between multiple images by selecting the corresponding image tabs.



Zoom

A **Zoom** slider bar is located under acquired images for zooming in and out on the image. The zoom level (percentage) is displayed next to the slider bar.

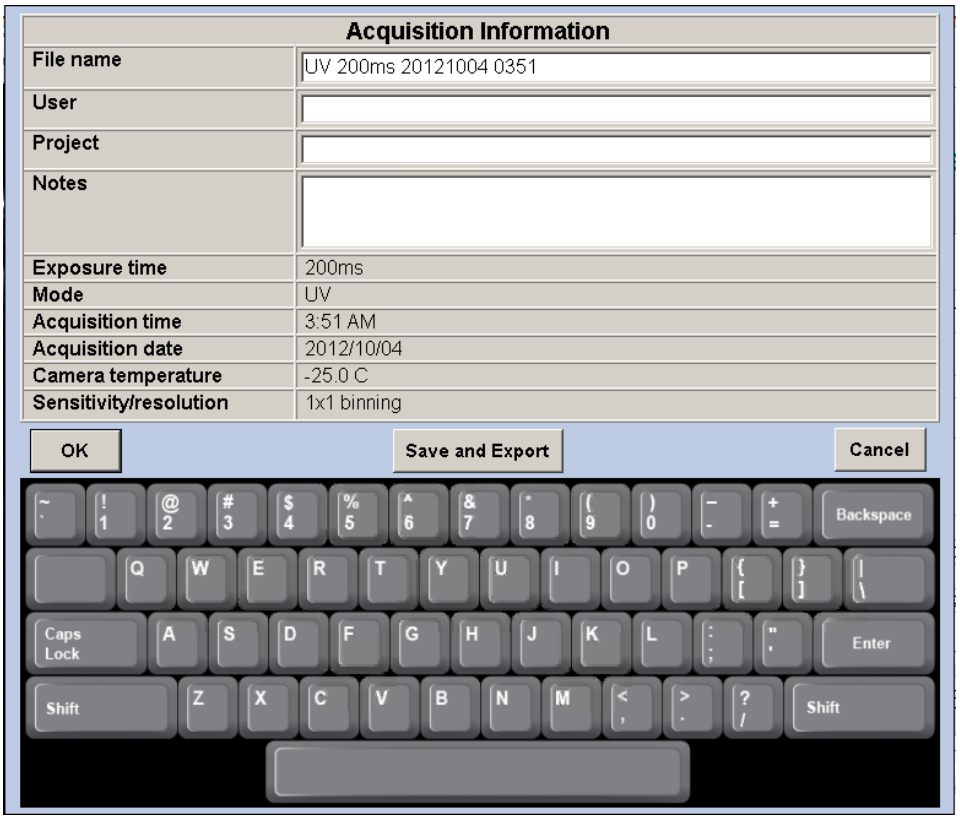
File Menu

File menu includes editing image info, exporting, printing and deleting files. All image files and image information are saved and exported in individual folders. These folders contain both the .xml file with the image information and the .tiff file containing the image.

Image Info Information for each captured image is stored within the individual .xml file.

With the captured image displayed, select the **Image Info** button. A box appears with all of the relevant image information for that image. Beneath the box is a keyboard for inputting personal data into the open fields. Only the fields for **File name**, **User**, **Project** and **Notes** can be modified.

Note After each image capture, the imager will assign a default name to the image file. This image file name can be changed within the **Acquisition Information** screen.



File name Image title (imager-generated or user-defined)

User Person using the MYECL Imager (user-defined)

Project Name of project (user-defined)

Notes Relevant notes pertaining to image or experiment (user-defined)

Exposure time Chosen exposure time for image

Mode Single, multiple, custom, UV or Vis

Acquisition time Time of day image was taken

Acquisition date Date image was taken

Sensitivity/Resolution Binning used for image acquisition

Export Select **Export** to save the highlighted image to a USB flash drive. External flash drives can access the imager through three different ports on the right side of the imager.

Note Users may need to momentarily wait for the imager to detect the external drive once it is connected to the USB port. The selected image is exported only to the first USB flash drive if there are more than two drives connected to the imager.

Print The **Print** button allows the highlighted image to be printed to a selected external printer. A **Print Preview** window appears before printing begins.

Delete The **Delete** button permanently deletes the highlighted image.

Ultraviolet (UV) Mode

Ultraviolet (UV) mode is used for the capture of images using transmitted UV light.

CAUTION UV mode uses the UV light in the transilluminator. Long-term exposure to UV light can be harmful. Use the appropriate eye and skin personal protective equipment (PPE) if there is any chance of exposure to the UV light.

Note The transilluminator UV light is initially on for 5 minutes. User input is requested for further use of the UV light. If the "Keep UV on" button is not selected, the UV light automatically turns off.

If the UV light is needed after opening the imager door, the white door peg can be pulled out to turn on the UV bulbs. Appropriate PPE must be worn if performing this operation. The white door peg returns to a normal position once the door is fully closed.

Extended "UV on" position

Retracted "UV off" position

Note The live image is displayed with the exposure time used in the previous image acquisition in UV mode unless the user changes the exposure time or changes the mode.

Camera Settings

UV mode uses the same functional Camera Settings as the Chemi mode, but adds the camera setting functions for Aperture, UV light and Filter wheel position.

Capture Settings

Image Acquisition

1. Select the UV tab on the touchscreen.
2. (Optional) Select the Live Camera button if the live image is not displayed.

3. Open the imager door and confirm that the UV light is off. The epi-white lights are activated once the door is opened. Pull out the transilluminator and place the UV exposure screen (clear) on top of the transilluminator.

4. Insert and center the sample on top of the UV exposure screen (clear) using the live image display for reference. Once the sample is centered, close the imager door.

5. While viewing the live image, adjust the necessary settings for **Focus**, **Digital Zoom, Sensitivity/Resolution, Filter** and **Aperture** to produce the desired image.

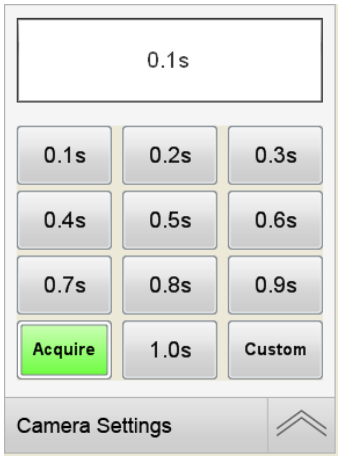
   Note Camera Settings are only available with the live image display.

Pre-set Exposure Time

1. (Optional) Select the **Live Camera** button if the live image is not displayed.

2. Select one of the pre-set exposure time buttons using the touchscreen keypad.

3. The live image with the new exposure time is displayed. If needed, modify the exposure time using the pre-set exposure time buttons.



4. Select the **Acquire** button to acquire an image.

5. Captured images are displayed on the screen and automatically stored in the **Gallery** for further viewing and selection.

Custom Exposure Time

1. Select the **Custom** exposure time button using the touchscreen keypad.

2. Enter the desired time in milliseconds (ms), seconds (s) or minutes (m) using the touchscreen keypad numbers. The **m : s** box is used to input seconds and/or minutes and is active by default (box is gray in color). For a custom exposure time of <1 second, select the **ms** box to input milliseconds. The shortest exposure time that can be entered is 10 milliseconds; selecting "**1**" from the keypad appears as "**10**" in the **ms** box.

3. Select the **Acquire** button to acquire an image.

4. Captured images are displayed on the screen and automatically stored in the **Gallery** for further viewing and selection.

Stop Image Acquisition

Upon selecting the **Acquire** button, a **Stop** window appears over the keypad. Selecting the **Stop** button stops the current image acquisition exposure and returns the screen to the current session exposure settings.

Image Tools

Note The Image Tools only function while viewing or printing the image. **Display Saturation, Invert, Auto Contrast** and **Adjust image** adjustments are NOT saved with the image file.

Display Saturation

In **UV** mode, while viewing the live image or after capturing an image, the **Display Saturation** button can be selected to highlight the image pixels that are considered to be saturated. A red false-color is superimposed on the pixels deemed to be saturated. Adjustment to the saturation can be done by adjusting the **Aperture** and/or exposure time for subsequent images. Shorter exposure times reduce the light exposure/saturation.

1. While viewing the live image display, select the **Display Saturation** button under the time keypad.

2. The screen displays the saturated areas of the image with a red false-color.

3. While viewing the live image display, in **Camera Settings**, use the **Aperture** slider bar to adjust the saturation by opening (moving slider to left) or closing (moving slider to right) the aperture. Opening the aperture increases image brightness and saturation. Closing the aperture decreases image brightness and saturation.

4. If required, the image exposure time may need to be increased or decreased to display a properly saturated live image. Exposure time can be adjusted before image capture by using the number keypad.

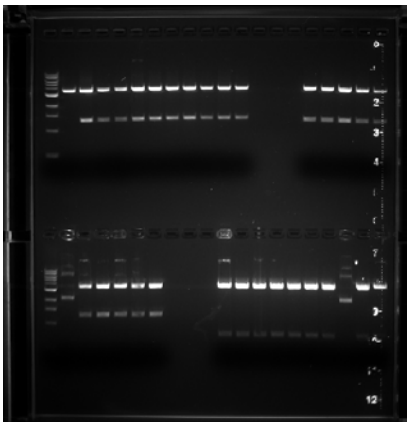
5. Select the **Display Saturation** button again to turn off the false-color imaging.

   Note The **Display Saturation** button is disabled when the **Auto Contrast** or **Adjust Image** functions are enabled.

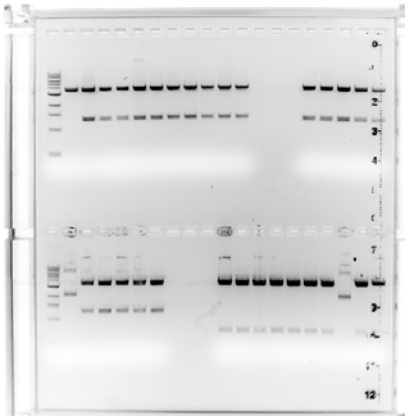
6. Proceed with the steps for acquiring an image.

Invert Image

The **Invert** button is a useful tool for viewing faint gel bands. This tool inverts the standard black background with white highlights to a white background with black highlights.



Original UV Image



Inverted UV Image

1. In the active live image, select the **Invert** button from under the time keypad.

2. The inverted image can be switched back to the standard image by again selecting the **Invert** button.

Auto Contrast

Selecting the **Auto Contrast** button increases the contrast between the signal and the background to increase visibility. This adjustment can be used only for viewing or printing of the image. The contrast adjustment is NOT saved with the image file.

Note **Auto Contrast** is disengaged when the **Adjust Image** button is selected.

Adjust Image

Select the **Adjust Image** button to modify the **Black**, **White** and **Gamma** levels of the image to increase sample visibility. This adjustment is only used for viewing or printing the image. Image adjustments are NOT saved with the image file.

Select the **Reset** button to restore **Black**, **White** and **Gamma** to original levels. Select the **Close** button to return to the previous screen.

Note **Adjust Image** is disengaged when the **Auto Contrast** button is selected.

Intensity Display

Select a point of interest on the acquired image to view the **Intensity Display** containing the pixel intensity and pixel coordinates of the corresponding region. When multiple images of the same sample are acquired and displayed on the screen, the pixel intensities of the same location can be viewed and compared between multiple images by selecting the corresponding image tabs.

Zoom

A **Zoom** slider bar is located under acquired images for zooming in and out on the image. The zoom level (percentage) is displayed next to the slider bar.

File Menu

The File Menu consists of buttons for **Image Info**, **Export**, **Print** and **Delete**.

Image Info

Image Info can be selected for any captured image. This lists the acquisition information for the highlighted image.

Export

Select **Export** to save the highlighted image to a USB flash drive. External flash drives can access the imager through three different ports on the right side of the imager.

Note Users may need to momentarily wait for the imager to detect the external drive once it is connected to the USB port. The selected image is exported only to the first USB flash drive if there are more than two drives connected to the imager.

Print

The **Print** button allows the highlighted image to be printed to a selected external printer. A **Print Preview** window appears before printing begins.

Delete

The **Delete** button permanently deletes the highlighted image.

Visible (Vis) Mode

Visible (Vis) mode is used for the capture of gel images using reflected and/or transmitted light.

CAUTION Vis mode uses the UV light from the transilluminator. Long-term exposure to UV light can be harmful. Use the appropriate eye and skin PPE if there is any chance of exposure to the UV light.

Note The transilluminator UV light is initially on for 5 minutes. User input is requested for further use of the UV light. If the "Keep UV on" button is not selected, then the UV light will automatically turns off.

Note The live image is displayed with the exposure time used in the previous image acquisition in Vis mode unless the user changes the exposure time or changes the mode.

Camera Settings

Vis mode uses the same functional Camera Settings as the UV mode.

Image Acquisition – Transmitted Light

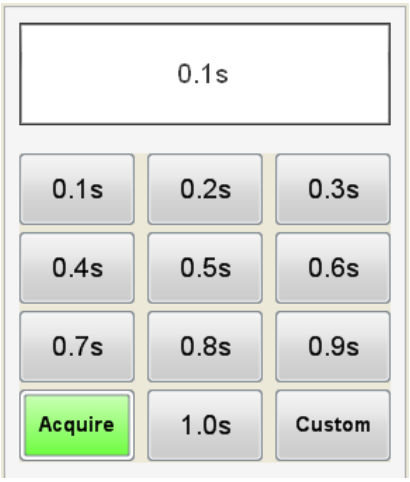
1. Select the Vis tab on the touchscreen. Changing to Vis mode automatically turns on the UV light within the transilluminator and the epi-white lights.
2. (Optional) Select the Live Camera button and enable the UV button if the live image is not displayed and the transmitted light is off.
3. Open the imager door, confirm the UV light is off, pull out the transilluminator and install the white light conversion screen on top of the transilluminator.
4. Insert and center the sample on top of the white light conversion screen using the live image display for reference.
5. Once the sample is centered, close the imager door. The UV light turns on and shows as visible light transmitting through the white light conversion screen.
6. While viewing the live image, adjust the necessary settings for Focus, Digital Zoom, Sensitivity/Resolution, Filter and Aperture to produce the desired image.
7. Select a pre-set or custom exposure time.

Image Acquisition – Reflected Light

1. Select the **Vis** tab on the touchscreen. Changing to **Vis** mode automatically turns on the UV light within the transilluminator and the epi-white lights.
2. (Optional) Select the **Live Camera** button and enable the **UV** button if the live image is not displayed.
3. Open the imager door, confirm that the UV light is off, and install the white light conversion screen on top of the transilluminator glass.
4. Insert and center the sample on top of the white light conversion screen using the live image display for reference.
5. Once the sample is centered, close the imager door. The UV light turns on.
6. Select the **UV** light button on the right side of the screen to switch **OFF** the UV light. This produces only reflected light.
7. While viewing the live image display, adjust the **Camera Settings** for **Focus**, **Digital Zoom**, **Resolution/Sensitivity, Filter** and **Aperture** to produce the desired image, if needed.
8. Select a pre-set or custom exposure time.

Pre-set Exposure Time

1. Select one of the pre-set exposure time buttons using the keypad.



2. Select the **Acquire** button to capture an image.

3. Captured images are displayed on the screen and automatically stored in the **Gallery** for further viewing and selection.

Note A **Stop** button appears over the keypad once the **Acquire** button is selected. Image acquisition can be stopped by selecting the **Stop** button.

Custom Exposure Time

1. Select the custom exposure time button using the keypad.

2. Enter the desired time using the keypad numbers. The **m : s** box is used to input seconds and/or minutes and is active by default (box is gray in color). For a custom exposure time of <1 second, select the **ms** box to input milliseconds. The shortest exposure time that can be entered is 10 milliseconds; selecting "**1**" from the keypad appears as "**10**" in the **ms** box.

3. Once a value is entered into the **Custom** time field, the **Acquire** button becomes active. Select the **Acquire** button to capture an image.

4. Captured images are displayed on the screen and automatically stored in the **Gallery** for further viewing and selection.

Note A **Stop** button appears over the keypad once the **Acquire** button is selected. Image acquisition can be stopped by selecting the **Stop** button.

Image Tools

Note The Image Tools only function while viewing or printing the image. **Display Saturation, Invert** , **Auto Contrast** and **Adjust Image** adjustments are NOT saved with the image file.

Display Saturation

In **Vis** mode, while viewing the live image or after capturing an image, the **Display Saturation** button can be selected to highlight live and captured pixels that are considered to be saturated. A red false-color is superimposed on the pixels deemed to be saturated. Adjustment to the saturation can be done by adjusting the **Aperture** and/or exposure time for subsequent images. Shorter exposure times reduce the light exposure/saturation.

1. While viewing the live image display, select the **Display Saturation** button under the time keypad.

2. The screen displays the saturated areas of the image with a red false-color.

3. Using the **Aperture** slider bar in **Camera Settings**, adjust the saturation by opening (moving slider to left) or closing (moving slider to right) the aperture. Opening the aperture increases image brightness and saturation. Closing the aperture decreases image brightness and saturation.

4. If required, the image exposure time may need to be increased or decreased to display a properly saturated live image. Exposure time can be adjusted before image capture by using the number keypad.

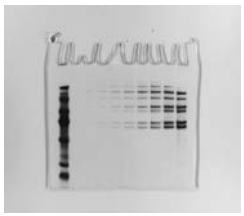
5. Select the **Display Saturation** button again to turn off the false-color imaging.

   Note The **Display Saturation** button is disabled when the **Auto Contrast** or **Adjust Image** functions are enabled.

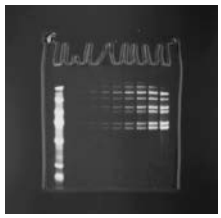
6. Proceed with the steps for acquiring an image.

Invert Image

The **Invert** button is a useful tool for viewing faint gel bands. This tool inverts the standard white background with black highlights to a black background with white highlights in **Vis** mode.



Original Vis Image



Inverted Vis Image

Auto Contrast

Selecting the **Auto Contrast** button increases the contrast between most bands and the background to increase visibility. This adjustment can be used only for touchscreen viewing or printing of the image. The contrast adjustment is not saved with the image file.

Note **Auto Contrast** is disengaged when the **Adjust Image** button is selected.

Adjust Image

Select the **Adjust Image** button to modify the **Black**, **White** and **Gamma** levels of the image to increase sample visibility. This adjustment is only used for viewing or printing the image. Image adjustments are NOT saved with the image file.

Select the **Reset** button to restore **Black**, **White** and **Gamma** to original levels. Select the **Close** button to return to the previous screen.

Note **Adjust Image** is disengaged when the **Auto Contrast** button is selected.

Intensity Display

Select a point of interest on the acquired image to view the **Intensity Display** containing the pixel intensity and pixel coordinates of the corresponding region. When multiple images of the same sample are acquired and displayed on the screen, the pixel intensities of the same location can be viewed and compared between multiple images by selecting the corresponding image tabs.

Zoom

A **Zoom** slider bar is located under acquired images for zooming in and out on images. The zoom level (percentage) is displayed next to the slider bar.

File Menu

The File Menu consists of buttons for **Image Info**, **Export**, **Print** and **Delete**.

Image Info

Image Info can be selected for any captured image. This lists the acquisition information for the highlighted image.

Export

Select **Export** to save the highlighted image to a USB flash drive. External flash drives can access the imager through three different ports on the right side of the imager.

Note Users may need to momentarily wait for the imager to detect the external drive once it is connected to the USB port. The selected image is exported only to the first USB flash drive if there are more than two drives connected to the imager.

Print The **Print** button allows the highlighted image to be printed to a selected external printer. A **Print Preview** window appears before printing begins.

Delete The **Delete** button permanently deletes the highlighted image.

Image Gallery

The image gallery allows the user to view and open previously captured images.

Image Viewing

1. Select the **Gallery** tab at the top of the touchscreen.
2. Click on the **Browse** button to open the gallery.

Thumbnail **Thumbnail** displays previously captured images. Images are separated into sections of days, weeks, months and years. You can use the two right middle arrow buttons or the vertical scrollbar to move and view between the sections. If the current gallery contains images from more than 40 image acquisitions, the program automatically creates a new gallery folder and move to the new gallery. Other galleries can be accessed using the up and down **Gallery** arrow buttons.

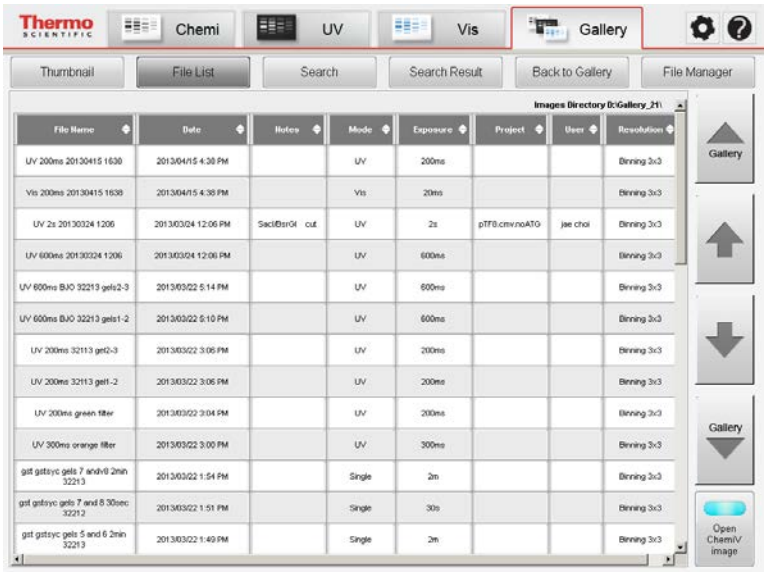
Choose an image or series of images (up to six images including ChemiV image) by selecting the images on the touchscreen. Selected images are highlighted in blue. Double-tap on an image or select the **Back to Gallery** button to return to the main image gallery screen.

Note Before selecting an image, users can choose to view only the Chemi image or both the Chemi and ChemiV images of the same sample by selecting the **Open ChemiV Image** button at the bottom right of the **Gallery** screen. This function is useful for establishing band locations in a Chemi image against known protein weight markers in a ChemiV image.

Note Select one ChemiM image to open all of the images associated with that specific multiple exposure. Up to six images, including ChemiV images, can be selected and displayed at one time.

File List

The **File List** button displays image information in a list format for ease of searching and sorting. The list is sortable in eight different fields by selecting the appropriate column heading: **File Name, Date, Notes, Mode, Exposure, Project, User** and **Resolution**.



Search

The **Search** tab allows you to search through the full gallery. Images can be searched by **File Name, Date, Notes, Project** or **User** by entering the needed information. The search results are displayed in the Search Result window; the results listings are sortable by field.

Search Results

The **Search Results** button allows for viewing results from the previous search. Results listings are sortable by field.

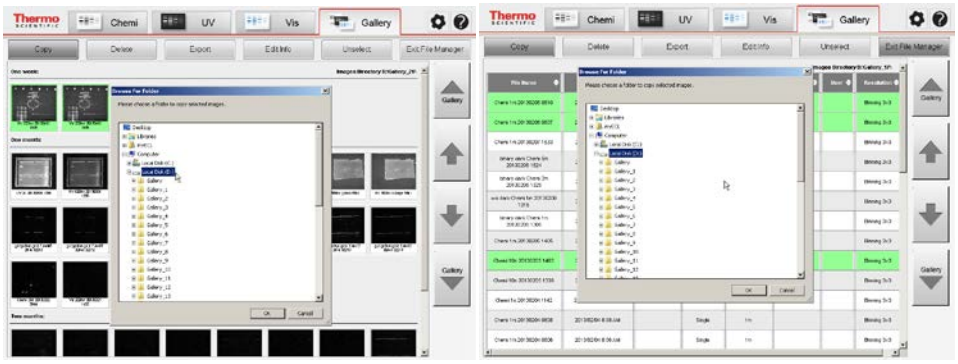
File Manager

The **File Manager** button allows for selection of multiple image files for copying, deleting, exporting and editing image information. Images selected in **File Manager** are highlighted in a light green color. The **File Manager** button can be selected from the **Thumbnail**, **File List** or **Search Results** screens.

Note **File Manager** in **Search Results** contains a **Select All/Unselect All** button in place of an **Unselect** button.

Copy

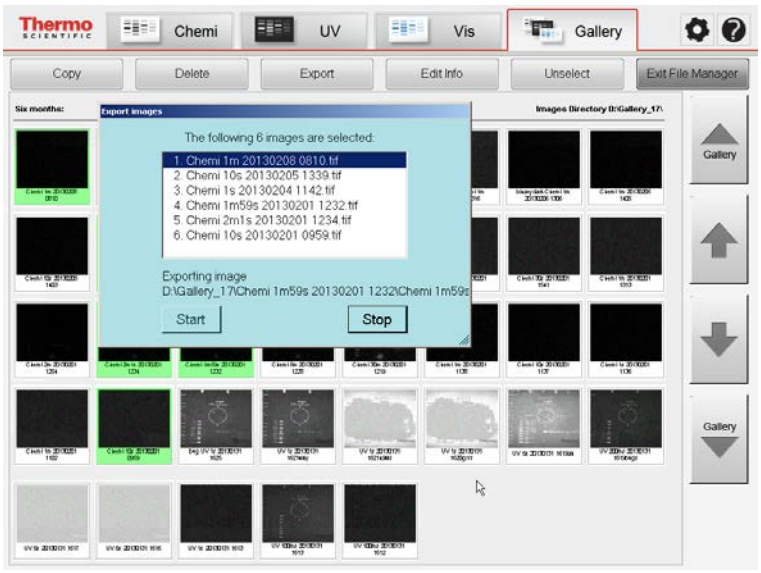
The **Copy** button allows users to copy the selected images from one or more gallery folders to the desired location.



Delete

The **Delete** button allows users to delete the selected images from one or more gallery folders.

Export The **Export** button allows users to copy the selected images to the first USB flash drive plugged into the imager.



Edit Info The **Edit Info** button allows users to create or change the User/Project/Notes fields of the acquisition information for the selected images. File names cannot be changed using **Edit Info** from **File Manager**.

Unselect The **Unselect** button removes all of the selections in the **File Manager**.

Exit File Manager Selecting the **Exit File Manager** button returns to the previous **Gallery** mode screen.

Chapter 4 Maintenance

Cleaning the Imager and Sample Screens

IMPORTANT When using any cleaning products with the imager, consult the appropriate material safety data sheet (MSDS) to confirm compatibility with the imager and proper usage of the cleaning product.

LCD Touchscreen

Spray a soft cloth or paper towel with cleaning solution (e.g., general purpose cleaner, isopropanol or 70% ethanol). Wipe the surface of the transilluminator, the sample screens and the imager's exterior housing.

Cleaning the Touchscreen

Use a pre-moistened LCD screen cleaning tissue to clean the surface of the touchscreen.

IMPORTANT Use of ammonia-based cleaners to clean the touchscreen is NOT recommended. Do not spray cleaner directly onto the LCD screen.

IMPORTANT Do not press hard while cleaning the screen. Do not leave excess cleaning solution on the LCD screen as this may cause long-term damage.

Use of the Stylus

The stylus is recommended for interacting with the touchscreen. Use the tip of the stylus to tap the touchscreen for selection of menus, icons, and buttons.

Note Fingertips can be used for interaction with the touchscreen; however, the stylus is easier to use with gloved hands and prevents fingerprints on the screen.

UV Transilluminator

CAUTION The UV transilluminator contains UV bulbs. Long-term exposure to UV light can be harmful. Use the appropriate eye and skin personal protective equipment (PPE) if there is any chance of exposure to the UV light.

Band Excision

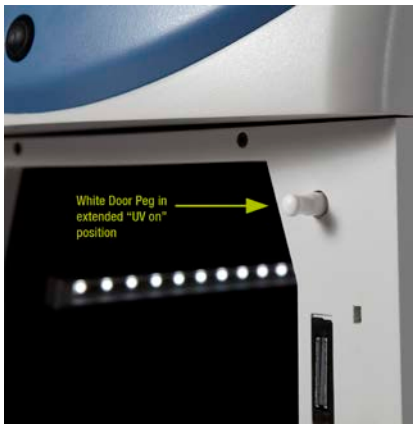
1. Wearing UV-protective eyewear and clothing, open the imager door and slide out the transilluminator.

2. Place the UV exposure screen (clear) on the transilluminator and place the gel sample on top of the screen.

   IMPORTANT Use of the UV exposure screen (clear) protects the transilluminator from nicks and scratches as a result of excision.

3. In UV mode, select the UV button. A message appears asking if the user wants to turn on the UV light with the door open. Select Yes.

4. The software then displays a warning message requiring the appropriate PPE and asks the user to pull out the white door peg.



Extended "UV on" position

Retracted "UV off" position

5. Excise the appropriate bands from the gel sample.

Note As a safety precaution, the UV light automatically turns off after five minutes. With 30 seconds remaining, a message appears on the touchscreen indicating that the UV light is turned off unless the "Keep UV on" button is selected.

6. When finished, turn off the UV light by pushing in the **white door peg**. Push the transilluminator back into the imager. Alternatively, push the transilluminator back into the imager and close the door, which automatically pushes the **white door peg** back into place.

Cleaning the Transilluminator

Ensure the transilluminator surface is cool. Saturate a clean soft cloth or paper towel with cleaning solution (e.g., general purpose cleaner, isopropanol or 70% ethanol). Wipe the surface of the transilluminator.

Replacement of Transilluminator Bulbs

Note To ensure uniform illumination, replace all six UV transilluminator bulbs, even if only one bulb fails.

1. Shut down the imager and unplug the power cord.
2. Open the imager door and completely slide out the transilluminator. Ensure the transilluminator is cool to touch.
3. Loosen the four thumbscrews on the transilluminator coverplate.
4. Lift the coverplate to expose the bulbs. Use caution to avoid damaging the electrical cord.
5. Remove the transilluminator bulbs by rotating ~90° counterclockwise until the pins align with the bulb socket. A click is heard when the bulb pins are aligned. Lift the bulb up and out of the socket.
6. Insert the new transilluminator bulbs by sliding pins into the bulb socket and rotating ~90° clockwise. A click is heard when the bulb pins are set.
7. Repeat Steps 5 and 6 for the remaining five bulbs.
8. Replace all necessary components of the transilluminator and avoid damaging the electrical cord. Replace and hand tighten the four thumbscrews.
9. Push the transilluminator back into the imager.
10. Plug the imager power cord back in and turn the system power on.

Emission Filters

A variety of emission filters can be used in the imager. The appropriate filter choice is dependent on the emission wavelength of the sample. Consult Table 2-5 in Chapter 2 to confirm the filter choice is appropriate for the application.

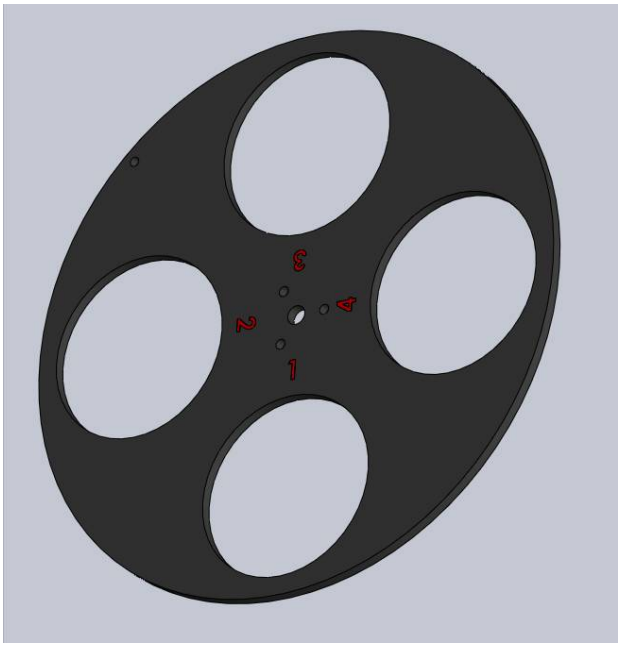
Changing Filters

The filter wheel allows for easy installation and removal by using threaded filters. The filters are fragile, so use caution when handling and installing or removing.

IMPORTANT When installing filters, ensure that the filter threads are correctly aligned with the filter wheel threads. **Forcing a filter to screw in can result in cross threading and damage to the filter wheel.**

1. Turn off the system power.
2. Open the imager door and locate the filter wheel at the rear of the cabinet. Each filter position is labeled with a red position number.

   Position 1 Permanently empty for chemiluminescent imaging
   Position 2 Orange filter (default filter supplied with the imager)
   Position 3 Open for additional filter
   Position 4 Open for additional filter



3. To install an emission filter, insert the threaded side of the filter into an open port on the filter wheel. Turn clockwise to screw the filter in place until hand tight.

4. To remove an emission filter, grasp the outer edge of the filter housing and turn counterclockwise to unscrew and remove.

5. When filter installation/removal is complete, turn the system power on.

6. Update the filter settings in the **Tools** menu. See Chapter 2: Imager for directions on changing the filter settings.

Appendix A
Technical Specifications

Imager Parameter	Specification
Power Maximum	120W
Frequency Range	50-60Hz
AC Voltage	100-240V
Current	1.2A maximum (dependent on supply voltage)
Fuse	T4AL, 250V, 4A fuse
Dimensions	21 inches H × 12.25 inches W × 22 inches D (53.3cm H × 31.1cm W × 55.9cm D)
Weight	65lbs (29.5kg)
Wavelength Range	Specific wavelengths between 370-700nm
Camera	High-resolution, thermoelectrically regulated at -25°C, 4.2MP digital camera with 16-bit dynamic range
Lens	50mm, f/0.95 aperture
Filter Wheel	4 filter positions, motorized
Touchscreen	10.4 inch LCD screen
Light Source	306nm trans-UV, epi-white
Manufacturer	Thermo Fisher Scientific 3747 N Meridian Rd Rockford IL 61105-0117 USA

Appendix B
Accessories

Product No.	Product Name	Package Size
62237†	MYImageAnalysis Software	1 CD
62238†	Orange Filter	1 filter
62239	Green Filter	1 filter
62240	Red Filter	1 filter
62241	Blue Filter	1 filter
62242†	Chemiluminescence Exposure Screen	1 screen
62243†	White Light Conversion Screen	1 screen
62244†	UV Exposure Screen	1 screen
62255	Transilluminator Bulb, 365nm	1 bulb
62258†	Transilluminator Bulb, 306nm	1 bulb
62261†	Touchscreen Stylus and Holder	1 package
62267†	Imaging Reference Target	1 package
EW84857	One Year Extended Warranty	
84858†	Power Cord/C13 Connector, North America	1 cord
84859†	Power Cord/C13 Connector, Continental Europe	1 cord
84860†	Power Cord/C13 Connector, United Kingdom/Ireland	1 cord

† Replacement part for accessory supplied with the MYECL Imager.

Appendix C
Related Thermo Scientific Products

Product No.	Product Name
34087	SuperSignal* West Pico Chemiluminescent Substrate
34075	SuperSignal West Dura Extended Duration Substrate
34095	SuperSignal West Femto Maximum Sensitivity Substrate
46640	SuperSignal Western Blot Enhancer
32209	Pierce* ECL Western Blotting Substrate
32132	Pierce ECL Plus Western Blotting Substrate
24615	Imperial Protein Stain, 1L
88518	PVDF Transfer Membrane, 0.45µm, 26.5cm × 3.75m
88018	Nitrocellulose Membrane, 0.45µm, 30cm × 3.5m
88610	Western Blotting Filter Paper, extra thick, 8.5cm × 9cm
26616	PageRuler* Prestained Protein Ladder, 10-170kDa, 2 × 250µL
26619	PageRuler Plus Prestained Protein Ladder, 10-250kDa, 2 × 250µL
26614	PageRuler Unstained Protein Ladder, 10-200kDa, 2 × 250µL
26634	Spectra* Multicolor Broad Range Protein Ladder, 10-260kDa, 2 × 250µL
26625	Spectra Multicolor High Range Protein Ladder, 40-300kDa, 2 × 250µL
26628	Spectra Multicolor Low Range Protein Ladder, 1.7-40kDa, 250µL
26612	Pierce Prestained Protein Molecular Weight Marker

Glossary

Aperture Diameter of the lens opening that limits the amount of light entering the camera

CCD Charge coupled device that converts a photoelectric signal into electronic data

CCD Camera Camera with CCD sensor used to capture moving and still images

Chemiluminescence (Chemi) mode Captures image of sample-emitted luminescent as well as sample image under epi-white light

Display Saturation Displays red-painted image pixels if pixel intensity reaches a value near saturation

Emission filter Optical glass filter mounted in the Filter Wheel; used for filtering specific wavelengths of light

Filter Wheel Automated wheel that can hold multiple filters in front of camera lens

Gallery Holding space for captured images

Hard (Main) Power Switch Main power rocker switch located on the rear imager panel

Lens Optical device that controls light transmission

Noise Imperfections in the image data

Plug-and-play Ability of a computer system to automatically configure and operate other connected devices

Remote Access Imager access by technical support to a remote location

Reset Returns camera settings to the standard or home value

Resolution Sharpness and clarity of an image; defined by the number of camera pixels used to capture an image

Sample screens The clear, black and white panels placed over the transilluminator during image acquisition

Sensitivity CCD camera's degree of response to light

Soft Power Switch Blue-lit round button located on the front imager panel

Stylus Pen-shaped device used to input commands on the touchscreen

Transilluminator Sliding sample work platform containing the UV bulbs

Ultraviolet (UV) mode Captures images using transmitted ultraviolet light

Visible (Vis) mode Captures image using transmitted light and/or reflected visible light

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